

Oct. 9, 1928.

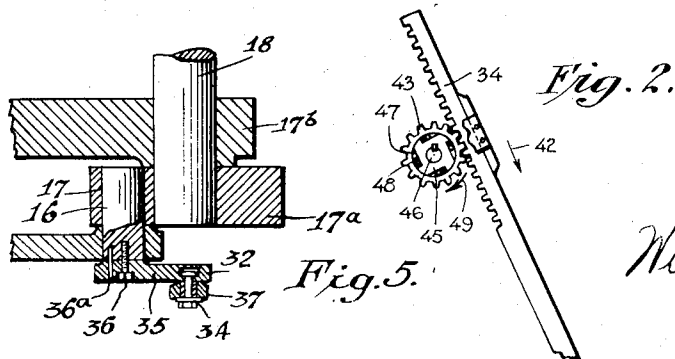
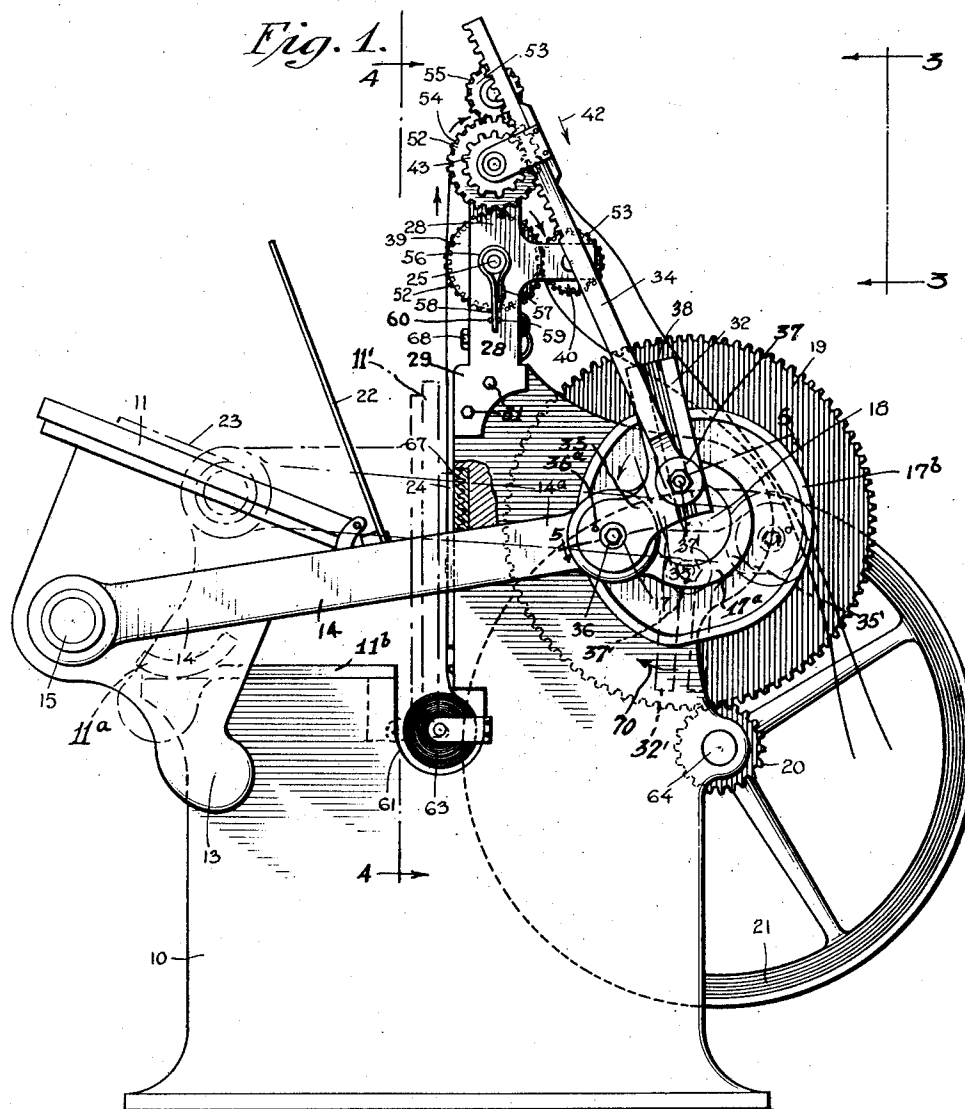
1,687,241

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VARIABLE FEEDING MECHANISM

Filed Feb. 9, 1925

2 Sheets-Sheet 1



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Fig. 3.

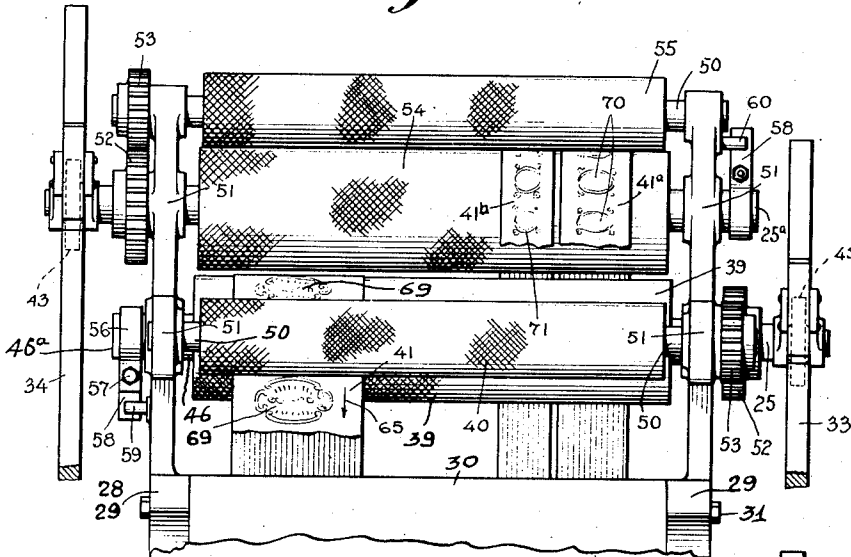
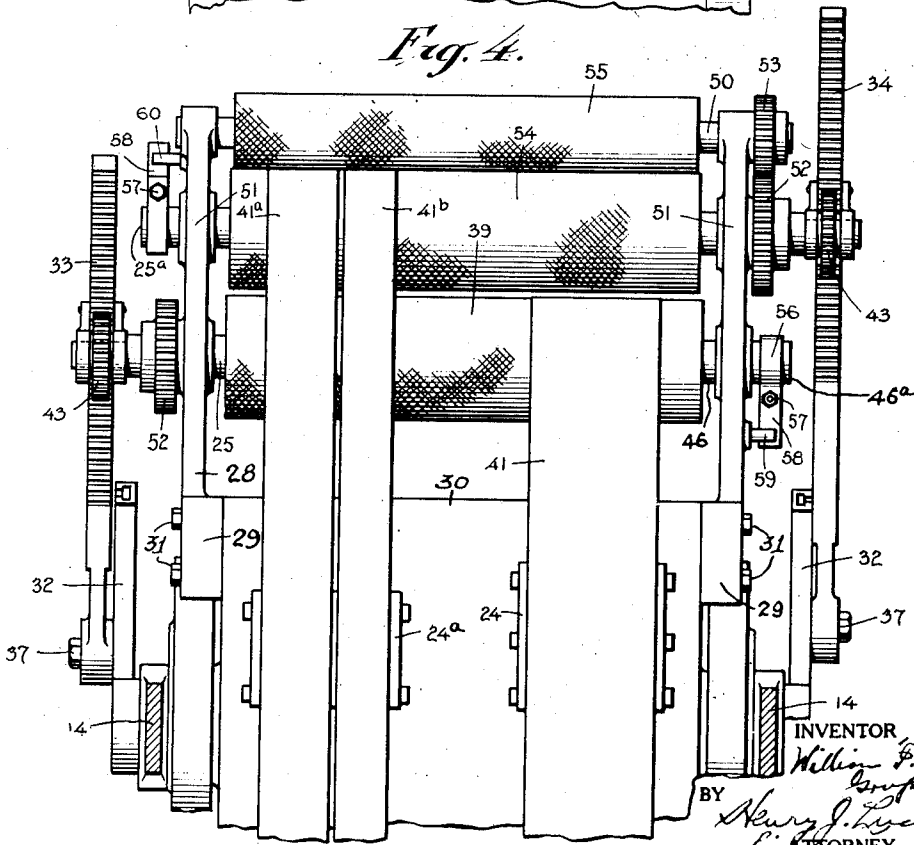


Fig. 4.



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UNITED STATES PATENT OFFICE.

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VARIABLE FEEDING MECHANISM.

Application filed February 9, 1925. Serial No. 8,038.

This invention relates to improvements in variable feeding mechanisms.

My invention is particularly adapted as an attachment to standard impression machines, stamping machines and like presses, and it will be understood that my invention is applicable as an integral or unitary construction with the aforesaid types of machines or of other types of suitable machines requiring adjustable feeding of one or more strips of metallizing media, inking or other character of material fed in striplike form for embossing, inking, color-impressing and like operations.

Under date of March 31st, 1924, I filed an application for U. S. Letters Patent, entitled Variable feeder for metallized transfer rolls, Serial No. 703,217, maturing as U. S. Patent No. 1,526,209, under date of February 10th, 1925, wherein I have set forth and claimed various forms of variable feeding attachments for stamping and other impression machines, and wherein the adjustment of the extents of feeding of the respective strips is individually regulated by means of manipulatable devices such as knurled heads respectively associated with inch-marked dials or the like, and wherein provision is made for the positive application of a stop for each feed roller at its stages of termination of its feeding movement, and thereby preventing by intermittently operated means the overthrow of the fed strip; and provision is also made for positively applying individual brakes for the respective feeding rolls in their return or non-feeding movements.

In the present invention, the adjustment for the setting of the extents of the feed of the respective strips is attained by the provision of adjustable cranks for the respective feed rolls, which cranks are applied to suitable actuating parts of the stamping or other impression machine and disposed in proper synchronism with the actuation of such parts and of the inclined angle plate or equivalent of the impression machine to which is fed the bookcase or cover or other article to be impressed. The actuation of each feed roll is preferably attained by means of a rack or equivalent combined with a ratchet or clutch or equivalent for the unidirectional drive of each feed roll in its feeding movement and the return of each rack by the idle movement of its ratchet or clutch which maintains the feed roll quiescent. The crank is preferably

adjusted to provide for the termination of its feeding movement of its feed roll at the stage of its minimum travel, thereby obviating the necessity of intermittently operated brakes individually for the feed rolls.

By the present form of my invention, there is attained simplicity of the installation of my mechanism for feeding a plurality of strips of transfer metal or other roll leaf to many forms of printing or other impression machines. My present invention also attains a form of feeding of the strip of transfer roll leaf characterized by a relative low rate of travel of the strip at its stage of its initial feeding movement at the beginning of which stage the strip is quiescent and then is detached from the heated die, whereafter the rate of travel of the strip is increased during an intermediate period, and finally the travel of the strip is reduced in its rate until it is again quiescent, preparatory to being again brought into contact with the heated die for the next impression.

My present invention also represents a more simplified form of adjustable feeding and attains adjustment of the feeding of the respective strips.

Further features and objects of the invention will be more fully understood from the following detail description and the accompanying drawings, in which

Fig. 1 is a side elevation of a standard stamping machine equipped with one form of my invention; this view indicates also the movement of the platen or angle plate and of its associated parts and also of one of the angle brackets for controlling the feed of the strip of transfer roll leaf;

Fig. 2 is a detail, in side elevation, with a part broken away, of one of the rack and ratchet roll drive mechanisms;

Fig. 3 is an elevation as viewed from the plane 3—3, Fig. 1;

Fig. 4 is an elevation as viewed on line 4—4 of Fig. 1; and

Fig. 5 is a sectional detail at 5—5, Fig. 1.

The press shown is of a known type including the base 10 on which the platen 11 is mounted for pivotal, swinging movement in any known or suitable way. The platen is oscillated by pitmen 14 located at opposite sides of the base, these being pivotally connected to the platen structure at 15 and each being connected at the other end to a crank pin 16 projecting from a crank disc 17.

These crank discs are fixed to opposite ends of a shaft 18 which extends across the machine and is mounted in suitable bearings, not definitely shown. A large gear 19 is also secured on shaft 18 in one side of the machine, and this gear is driven by a pinion 20 secured on a shaft 64, which also carries the fly wheel 21. 22 are guides or holders to co-operate with the platen in receiving and holding a book cover 23 or similar article to be impressed.

Usually, the fly wheel 21 is located at the left-hand side of the impression machine as viewed from the normal position of the operator when standing in front of the machine (or at the left in Fig. 1), in the operation of manually feeding successive bookcases 23 upon the feeding angle plate 11 for impression by means of the die 24 and the metallized, inking or other transfer media supplied by the strips as is set forth more particularly hereinafter.

To equip such and like forms of impression machines with my invention, I provide the open frame 28 mounted by means of the oppositely disposed brackets 29 on the substantially vertical bed plate 30. Each bracket 29 is shown secured by means of its bolts 31, positioned in suitable threaded openings tapped in the sides of the vertical bed plate 30. Such open frame 28 carries the respective sets of feed rolls described more fully hereinafter for feeding the strips of metallizing or other media.

Coacting with each set of feed rolls, I provide an adjustable slotted crank arm 32 for attaining the desired variable throw of its respective rack 33 or 34, at the opposite sides of the impression machine. The adjustable cranks 32 are respectively set in proper synchronism with the actuation of the feeding angle plate 11 and its actuating parts by the provision of the brackets 35, adjustably set by means of the nuts 36 and locking pins 36^a, see Fig. 5, to the respective ends 14^a of the pitmen 14. By setting the clamping bolt 37 of each rack 33, 34 relative to the adjusting groove 38 of the respective adjustable cranks 32, the extents of throw of the racks 33, 34 are individually regulated.

As indicated in Figs. 1 and 3, the right-hand rack 33 may serve to regulate the feeding movement of the lower set of feeding rolls 39, 40 for controlling the extent of feeding of the strip 41, shown at the left in Fig. 3. The stroke of the rack 33 in its feeding movement of its feeding rolls 39, 40 is downwardly, as is indicated by the arrow 42 in Figs. 1 and 2, and the return stroke of the rack 33 in its non-feeding movement of the feeding rolls 39, 40 is in a direction opposite to that of the arrow 42. As one form of positive driving connection between the rack 33 and its feeding rolls 39, 40, I provide a centrally hollow gear 43 whose teeth mesh with the

teeth of the rack 33, and within the gear 43 I provide the friction roller clutch or ratchet or equivalent unidirectional drive connection, the clutch member 45 of which is keyed or otherwise secured to the shaft 46 and provided with wedge-shaped recesses 47 which may be four in number as indicated in Fig. 2, and respectively receiving the cylindrical rollers 48. Accordingly, upon movement of the rack 33 in its actuation stroke in the direction of the arrow 42, the gear 43 is rotated in the direction of the arrow, see Fig. 3, whereby the cylindrical rollers 48 are forced within the constricted portions of the wedge-shaped recesses 47 to close the clutch 44 and thereby rotate the shaft 46 also in the direction of the arrow. The feed roll 39, which may be termed the main feeding roll, is splined or otherwise secured to its shaft 25. Its coacting or auxiliary feed roll 40 is mounted in suitable close adjacency to the main feed roll 39, as on the shaft 50 mounted in the oppositely disposed bearings 51, see Fig. 3, in the frame 28, which shaft 50 carries the gear 52, the teeth of which mesh with the gear 53 keyed on the shaft 25, to provide for positive actuation between the main feed roll 39 and its auxiliary feed roll 40.

In a similar manner, the rack 34 is connected by similar driving connection with its set of main feeding roll 54 and auxiliary feed roll 55 and preferably by a similar clutch or ratchet movement providing for a unidirectional actuation of the feeding rolls 54, 55 by the rack 34, and like parts are designated by like reference numbers. The provision of positive gearing between the auxiliary feeding roll 55 and its main feed roll 54 is preferably similar to that of the auxiliary feeding roll 40 relative to its main feed roll 39, and like parts are designated by like reference characters. The strip of metallized or other transfer medium fed by the rolls 54, 55 is marked 41^a.

It will be noted that the auxiliary rolls 40, 55 are respectively of lesser diameter than their respective main rolls 39, 54, thereby providing for an increased movement of the auxiliary rolls 40, 55 relative to their main rolls 39, 54 and thus creating continuous tautness in the respective strips 41 and 41^a fed by the respective sets of feeding rolls.

For the purpose of attaining a simplified form of the open frame 28, the auxiliary feeding roll 40 may be disposed horizontally at one side of its main feeding roll 39, whereas the auxiliary feeding roll 55 may be positioned above its main feeding roll 54, see Fig. 1. Such arrangement of the feeding rolls facilitates the operation of manually threading the respective strips 41, 41^a between the respective main and auxiliary feeding rolls and provides spaced paths for the used or waste portions of the strips.

When it is desired to provide the respective

sets of feeding rolls with a braking device, this being desirable when the feeding rolls are of large size. Such braking devices may be of the type of continuous braking action, in which event the braking device may be in the form of a strap 56 of metal or the like encircling the exposed end 46^a of the shaft 46, of the feed roll 39, and similarly at the exposed end 25^a of the shaft of the feed roll 54, the opposing portions of which strap 56 are adjustably pinched relative to one another by means of the bolt 57 passing through suitable openings in the two portions of the strap 56. The free end or ends 58 of the strap 56 are held in position by the oppositely disposed retaining pins 59, 60.

The rolls of metallized strips or like media may be conveniently located in the recess 61 usually present below the vertical bed plate 30 or a suitable open frame or like carrier provided. In Fig. 1, one roll of fresh metallized media is indicated at 63, the free length 41^a of which is threaded between the coacting feeding rolls 54, 55, and a like roll of fresh media supplies the length 41 threaded between the coacting feeding rolls 39, 40.

The main shaft of the impression machine is indicated at 64, which is usually provided with fast and loose pulleys for receiving a driving belt, or such main shaft 64 may be driven by an electric motor directly or through suitable gearing as may be desired.

The operation of the parts of my invention will be largely understood from the above description. It will be appreciated that my invention provides for the feeding of one, two or more strips to any desired adjusted extents. For economy of metallized medium, one strip, say the strip 41 serves to feed the required metallizing or other medium to the portion of the die of greater length of impression and the other strip 41^a fed to the portion of the die of relatively reduced length. Similarly, two or more strips may be fed to like extent by the set of feed rolls 39, 40, and likewise two or more strips may be fed to like extent by the set of feed rolls 54, 55.

It will be observed that the stage of movement of the strips 41, 41^a relative to their respective portions of the die 24 takes place at a stage when the angle plate 11 is not in close adjacency to the vertical bed plate 62 and as indicated in Fig. 1 the feeding of the two strips 41, 41^a takes place simultaneously at the stage when the angle plate 11 moves in its direction away from the vertical bed plate 62.

The used portion of the strip 41 passes beyond the feeding rolls 54, 55 rearwardly of the impression machine as indicated by the arrow 65, see Fig. 3, and the used portion of the strip 41 passes beyond its set of feeding rolls 39, 40 in a similar manner, as will be apparent from Fig. 3.

It will also be observed that the stage of termination of the feeding movement of the

respective racks 33, 34 is attained when the cranks 32 are at their lowest points of movement, at which stage the racks 33, 34 are at their minimum rate of displacement, and accordingly actuating by positive drive at minimum speed the rotation of the respective feeding rolls 39, 40 and 54, 55, thereby reducing the possibility of overthrow. Similar minimum movement of the racks 33, 34 ensues at the stage of initiation of the positive actuation of the feeding rolls 39, 40 and 54, 55.

If desired, two dies 24, 24^a, see Fig. 4, may be employed.

In Figs. 3 and 4, I have indicated two strips 41^a, 41^b fed by the set of feed rollers 54, 55 to equal extents relative to the die 24^a, whereas but one strip 41 is fed by the other set of feed rollers 39, 40 to its desired extent.

The adjustable cranks 32 are preferably marked in scale indications extending longitudinally of the adjusting grooves 38 corresponding to the extents of actuation of the feeding rolls in inches, centimeters or other linear unit.

To conveniently equip the standard press illustrated in the drawings with suitable means for heating the die or dies 24, 24^a, one or more electrical heaters 67 preferably in the form of metal blocks enclosing the resistance wire in insulated relation therewithin, are employed, which heaters are preferably positioned within slots or grooves planed within the face of the vertical bed plate 30. The die or dies 24, 24^a are removably secured to the outer face of such heater or heaters 67 by screws, clamps or the like. The switches of the set of heaters 67 are indicated at 68, see Fig. 1.

For convenience of manufacture, the feed-rolls 39, 40, 54, 55 are of substantially cylindrical contour and extend from one side to the opposite side of the frame 28; the cylindrical faces of the aforesaid rolls are usually milled to effect substantial frictional engagement with the respective strips fed by the feed rolls.

The residue of the impressions on the strip 41 are indicated in Fig. 3 at 69, and the residue of the impressions in the strips 41^a, 41^b are respectively indicated at 70, 71, see Fig. 3, and at like spacings from one another.

From the above, it will be apparent that my invention provides a most simple form of strip feed attachment for printing presses and other impression machines, enabling such attachment to be readily installed without disturbing the parts of the impression machine proper.

In such eccentric or crank form of attachments, the actuation of each feeding roll is attained by a drive which imparts a very slow initial movement to the transfer strip which previous to this stage was brought with its paper face into contact with the heated die

by the movement of the platen 11 from its full outline position shown in Fig. 1 to its position shown by the dot and dash outline 11', such movement of the platen 11 causing the book-case 23 or other article to be impressed to engage the metallized face of the transfer strip. Often, such action on the transfer strip causes it to cling more or less to the face of the die, and accordingly such slow initial movement of the transfer strip separates by a gentle motion the transfer strip from the die. The position of the crank bracket 35 corresponding to the position of the dot and dash outline position 11' of the platen, is indicated by the dot and dash outline 35' and the corresponding position of the adjustable slotted crank arm 32 is indicated at 32', which at this stage and rotating in the direction indicated by the arrow 70, effects a minimum displacement of the roll actuating rack 34; upon the continued rotation of the crank arm 32 it imparts an increasing rate of displacement of the rack 34 until a maximum rate is attained, whereafter the rate of travel of the rack 34 is gradually reduced until it is brought again to quiescence, at which stage the transfer strip is prepared for the next impression to be made therefrom. A similar action takes place relative to the rack 33.

The feeding of the transfer strips by the racks 33, 34, is carried out by the use of feed rolls, as above set forth, and accordingly, the above character of motion imparted to the racks 33, 34, is likewise imparted to the feed rolls, with attendant advantages of automatically overcoming the momentum or inertia of the respective feed rolls.

Whereas, I have described my invention by reference to specific forms thereof, it will be understood that many changes and modifications may be made without departing from the spirit of the invention.

I claim:

1. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, and means for adjustably connecting said devices respectively with said actuating means in synchronism therewith and to regulate the extents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

2. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a

plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of racks for individually actuating said feeding rolls and means for adjustably connecting said racks respectively with said actuating means for reciprocating and bodily oscillating said racks in synchronism therewith including an initial stage of substantial period at a relatively low speed and to regulate the extents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

3. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, each of said feeding devices including a unidirectional actuating member and means for adjustably connecting said devices respectively with said actuating means in synchronism therewith and to regulate the extents of feeding of the respective strips of impression media by said feeding rolls relative to the die.

4. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, each of said feeding devices including a clutch, and means for adjustably connecting said devices respectively with said actuating means in synchronism therewith and to regulate the extents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

5. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, each of said feeding devices including a rack and a unidirectional actuating member, and means for adjustably connecting said racks respectively with said actuating means in synchronism therewith and to regulate the ex-

tents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

6. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, each of said feeding devices including a rack and a clutch, and means for adjustably connecting said racks respectively with said actuating means in synchronism therewith and to regulate the extents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

7. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said feeding rolls respectively, a plurality of devices for individually actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed, each of said feeding devices including a rack and a ratchet clutch, and means for adjustably connecting said racks respectively with said actuating means in synchronism therewith and to regulate the extents of feeding of the respective strips of impression media fed by said feeding rolls relative to the die.

8. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said article feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said plurality of feeding rolls, a plurality of arms, each arm individually actuating one of said feeding rolls, and adjustable means for bodily reciprocating and oscillating said arms respectively with said actuating means, said adjustable means including a cam set to attain the ending limit of the throw of its feed roller actuating movement at a reduced speed.

9. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said article feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said plurality of feeding rolls, a plurality of arms, each arm individually actuating one of said feeding rolls, and adjustable means for connecting said arms respectively with said actuating

means, said adjustable means including a cam set to initiate the throw of its feed roller actuating movement at a reduced speed.

10. The combination with suitable die-holding means, suitable means for feeding an article to be impressed by the die and suitable means for actuating said article feeding means, of a plurality of feeding rolls, means for supporting a plurality of strips of impression media to be fed by said plurality of feeding rolls, a plurality of arms, each arm individually actuating one of said feeding rolls, and adjustable means for connecting said arms respectively with said actuating means, said adjustable means including a cam set to attain the ending limit of the throw of its feed roller actuating movement at a reduced speed and to initiate the throw of its feed roller actuating movement at a reduced speed.

11. A feeding mechanism for stamping and other impression machines provided with die-holding means; comprising suitable means for supporting a plurality of strips of impression material; and means for feeding said plurality of strips respectively to said die-holding means to regulatable extents by a movement including an initial stage of substantial period at a relatively low speed, said feeding means comprising a plurality of separate pairs of feeding rolls, means for individually regulating the extents of feeding movement of said pairs of feeding rolls respectively and means driven from the impression machine for actuating said feeding rolls.

12. A feeding mechanism for stamping and other impression machines provided with die-holding means; comprising means for supporting a plurality of strips of impression material; and means for feeding said plurality of strips simultaneously respectively to said die-holding means to regulatable extents, said feeding means comprising an open frame, a plurality of separate pairs of feeding rolls, said rolls being rotatably mounted in said open frame, each of said rolls being substantially cylindrical and extending substantially from one side of said open frame to the opposite side thereof, separate trains of gears respectively driving said pairs of feeding rolls, means for individually regulating the extents of driving movement of said gears to thereby regulate the extents of effective feeding movement of said pairs of feeding rolls respectively and means driven from the impression machine for driving said gears.

13. A feeding mechanism for stamping and other impression machines provided with die-holding means, comprising means for supporting a plurality of strips of impression material; and means for feeding said plurality of strips respectively to said die-holding means to regulatable extents; said

- feeding means comprising a plurality of separate pairs of feeding rolls, means for individually regulating the extents of feeding movement of said pairs of feeding rolls respectively and adjustable means driven from the impression machine for actuating said feeding rolls by a movement including an initial stage of substantial period at a relatively low speed.
- 10 14. A feeding mechanism for stamping and other impression machines provided with die-holding means; comprising means for supporting a plurality of strips of impression material; and means for feeding
- 15 said plurality of strips simultaneously respectively to said die-holding means to regulatable extents, said feeding means comprising an open frame, a plurality of feeding rolls, said rolls being rotatably mounted in said open frame, each of said rolls being substantially cylindrical and extending substantially from one side of said open frame to the opposite side thereof, separate trains of gears respectively driving said plurality of feeding rolls, means for individually regulating the extents of driving movement of said gears to thereby regulate the extents of effective feeding movement of said feeding rolls and adjustable means driven from the impression machine for driving said gears.
- 20 25 30
- In testimony whereof I have signed this specification this 9th day of February, 1925.

WILLIAM F. GRUPE.