March 30, 1965 H. A. BENSON 3,175,822

FEEDING MECHANISM FOR ENVELOPE PRINTING PRESS

Filed July 23, 1962 2 Sheets-Sheet 1

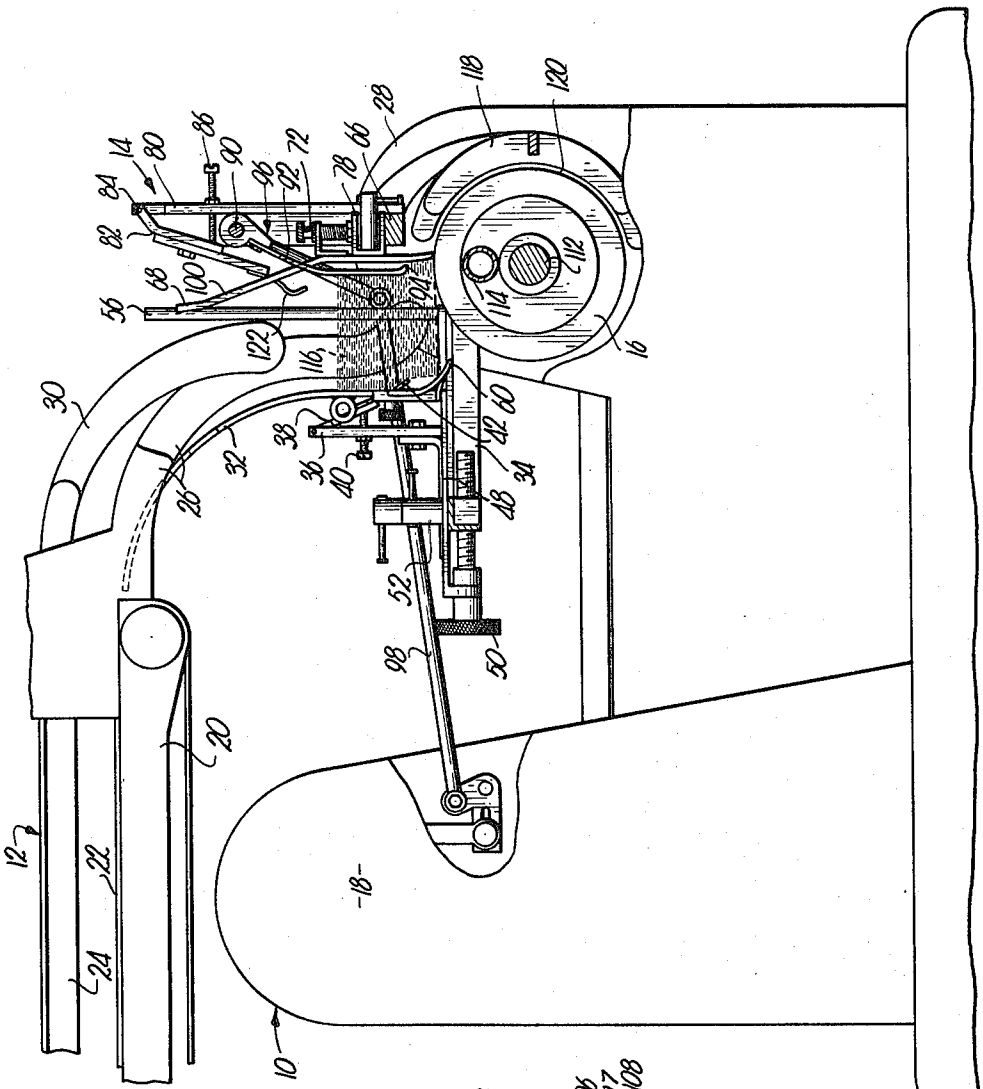



Fig. 1.

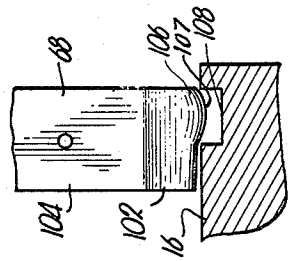



Fig. 3.

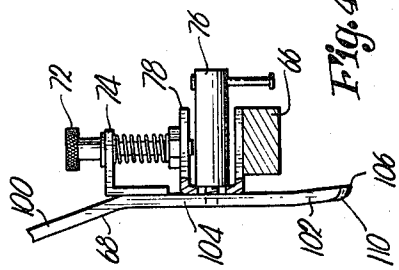



Fig. 4.

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Fig.3.

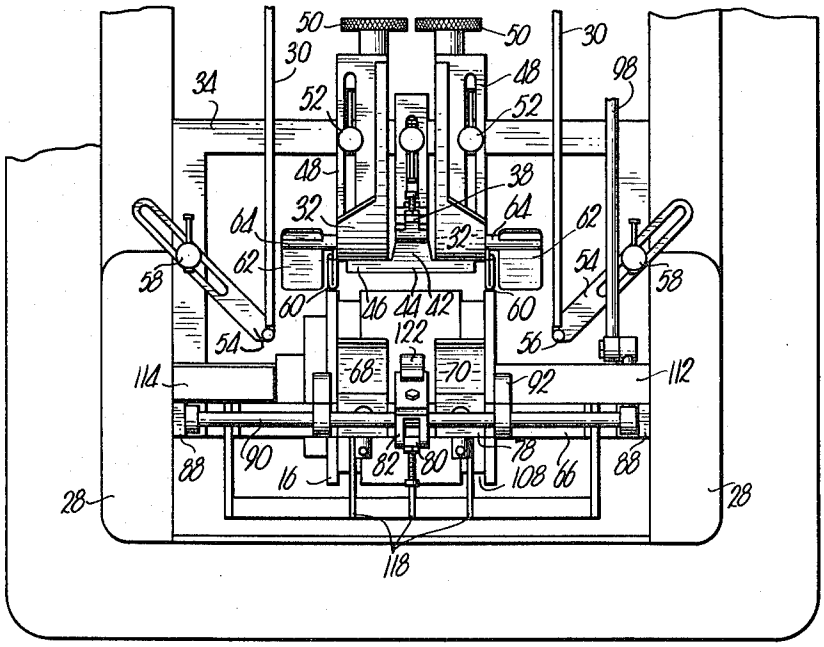
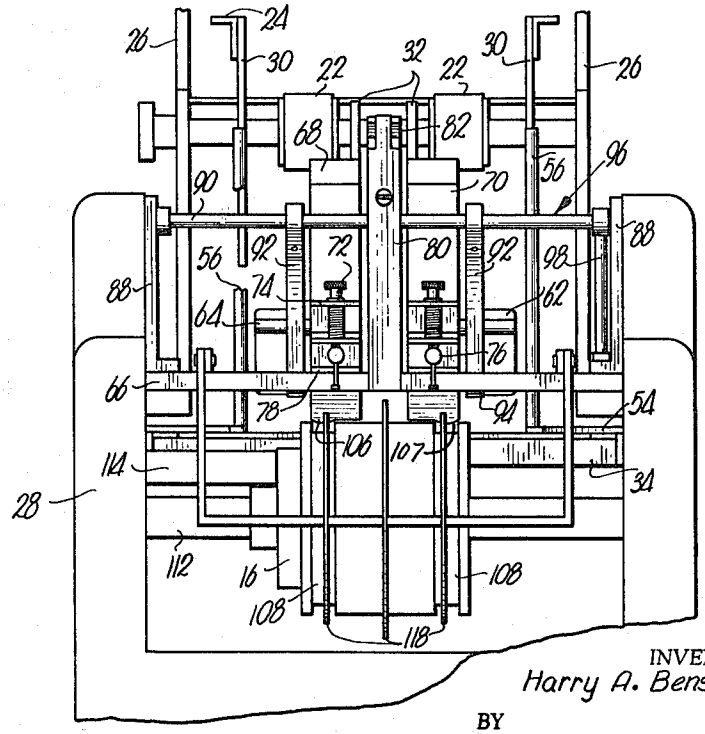



Fig.2.




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3,175,822

# FEEDING MECHANISM FOR ENVELOPE PRINTING PRESS

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14 Claims. (Cl. 271—2)

This invention relates to means for feeding workpieces, such as envelopes and the like, to a printing press, the particular feeding mechanism hereinafter described being operable in such a manner that the workpieces such as envelopes may be fed through said mechanism and to the printing press at a high rate of speed and in such a manner as to prevent jamming of the mechanism and the press.

It is a primary object of this invention to provide feeding mechanism for envelope printing presses or the like which mechanism is particularly adapted to be used in connection with printing presses such as disclosed in U.S. Letters Patent No. 2,635,538, issued April 21, 1953, and U.S. Letters Patent No. 2,853,296, issued September 23, 1958.

A perusal of the above-mentioned patents reveals that both of the same relate to presses for printing envelopes and the like, and that the same disclose different means for feeding the envelopes from a supply stack on the printing press. It has been found that the feeding mechanism disclosed in Patent No. 2,853,296 is unsatisfactory for use in connection with a machine wherein it is desired to print envelopes at a high rate of speed and accordingly, the feeding mechanism hereinafter described has been developed as an improvement over that disclosed in Patent No. 2,853,296.

Thus, a major object of this invention is to provide feeding mechanism which may be accommodated to a printing press of the type disclosed in the above-mentioned patents wherein there is provided means for conveying envelopes to the mechanism and means in the nature of a withdrawal cylinder for removing envelopes from the mechanism and individually delivering the same to the printing press, which feeding mechanism insures a smooth and continuous flow of envelopes from the conveying means to the withdrawal cylinder, and also insures that the envelopes are fed to the cylinder one at a time as is desired in presses of the nature hereinabove referred to.

A yet further object of this invention is to provide a feeding mechanism for envelope printing presses, which mechanism includes a pair of feed control arms having an uppermost portion in the path of the envelopes as they move from the conveying means to the withdrawal means, and a lowermost portion which is in engagement with the section of the stack of envelopes in the mechanism adjacent the withdrawal cylinder, there being a shiftable assembly having a pair of depending plates which are in engagement with the section of the stack of envelopes between the uppermost and lowermost portions of said arms whereby said section of the stacks is urged away from said arms and into engagement with said support means which are disposed in spaced, opposed relationship to said arms and shiftable plates.

Yet another aim of this invention is to provide a feeding mechanism for envelope printing presses which has a pair of feed control arms for controlling the flow of envelopes through the mechanism and to the withdrawal cylinder, the said arms having a tongue formed at the lowermost ends thereof, which tongue is arcuate in longitudinal configuration and has a rounded edge on the face thereof proximal to the envelopes, the tongue of said arms cooperating with the grooved withdrawal cylinder whereby to insure a smooth, continuous and one-at-a-time



delivery of the envelopes from the feeding mechanism to the withdrawal cylinder.

Other objects of this invention include details of construction of the shiftable assembly, the feed control arms and the support means for the envelopes as they pass through the mechanism, the same being apparent from the following specification and accompanying drawings, wherein:

FIGURE 1 is a fragmentary, side elevational view of one end of an envelope printing press showing the subject feeding mechanism, portions being broken away and in section to reveal details of construction;

FIG. 2 is a fragmentary, front elevational view of said one end portion of the envelope printing press incorporating the present feeding mechanism;

FIG. 3 is a fragmentary, top plan view corresponding to the view in FIG. 2;

FIG. 4 is an enlarged, fragmentary view of one feed control arm showing the mounting and adjusting means therefor; and

FIG. 5 is an enlarged, fragmentary view of one face of the lower end portion of one of the feed control arms and showing a portion of the withdrawal cylinder.

The envelope printing press, broadly designated by the numeral 10, in connection with which the present feeding mechanism is intended to be utilized, is substantially identical to the press disclosed in U.S. Patent No. 2,853,296 in that said press includes means 12 for conveying envelopes to the feeding mechanism broadly designated as 14, and a withdrawal cylinder 16 for removing envelopes from the feeding mechanism 14 and individually delivering the same to the press portion of the unit 10, this portion not being shown in the drawings but the same being housed within the casing designated as 18.

The conveying means 12 consists broadly of a feeding table 20 having a continuous conveyor belt 22 running thereover, there being side guides such as 24 adjustably carried by said table 20 whereby the same may be adjusted to accommodate envelopes of various sizes which are to be fed to the press 10.

Feeding table 20 has arcuate extensions 26 which extend downwardly in the manner best shown in FIGS. 1 and 3, the said extensions 26 having their free ends suitably secured to the cylinder housing 28. Likewise, the side guides 24 have resilient, arcuate extensions 30 which extend beyond the feeding table 20 in the manner disclosed in the drawings whereby to cooperate with a curved base support member 32 in moving the envelopes from the end of belt 22 into the feeding mechanism 14.

The feeding mechanism 14 is disposed between the conveying means 12 and the withdrawal cylinder 16 in such a manner as to receive envelopes delivered thereinto by the conveying means 12 and to insure the orderly removal of envelopes therefrom by the withdrawal cylinder 16.

Feeding mechanism 14 includes a frame 34 carried by the cylinder housnig 28 and extending rearwardly therefrom toward the casing 18, said frame 34 carrying an upstanding post 36 having a swingable lever 38 pivotally secured thereto at the upper end of post 36 and an adjusting screw 40 carried by the post 36 and bearing against a surface of the lever 38 whereby to allow the adjustment of the angle of inclination of lever 38 with respect to post 36.

Lever 38 carries at the free end thereof, a support plate 42 which has an arcuate, transverse configuration and a plan configuration as illustrated in FIG. 3 of the drawings, said support plate 42 having a central portion 44 and a pair of laterally extending wings 46, which wings 46 are disposed in front of the curved support members 32, all as clearly shown in FIG. 3 of the drawings.

The curved support members 32 have their lower free

ends secured to the frame 34 as by bracket 48, there being an adjusting screw 50 carried by said frame 34 and coupled with said brackets 48 whereby the curved support members may be adjusted to accommodate the present machine to envelopes of various sizes. A locking screw 52 serves to retain said brackets 48 in their desired positions of adjustment.

The frame 34 also carries, through slotted plates 54, a pair of spaced-apart, upstanding posts 56, said posts being adjustable through the use of locking screws 58 whereby the same may be disposed in the desired relationship to accommodate the mechanism 14 to envelopes of various sizes.

Secured to the upstanding portions of brackets 48 which secure curved supports 32 to the frame 34 are a series of auxiliary fingers 60, said fingers being arcuate in transverse configuration as best shown in FIG. 1 of the drawings, and being disposed at a position below the support plate 42 for reasons which will be hereinafter made apparent. It is preferred that there be four such fingers 60 whereby to support properly an envelope of any length as hereinafter described. It is also contemplated that extensions such as 62 may be suitably secured to the curved support 32 as by pins 64 whereby the feeding mechanism 14 may be enlarged to accommodate envelopes of greater length.

A crossbar 66 is secured to and spans the distance between the upstanding cylinder housing members 28, the crossbar having secured thereto, in the manner illustrated in detail in FIG. 4, a pair of substantially identical feed control arms 68 and 70, said arms 68 and 70 being generally arcuate in configuration. Said arms 68 and 70 are vertically adjustable with respect to the crossbar 66 and thus the cylinder 16 through the use of adjusting screws 72 which are coupled to their corresponding feed control bars as by L-shaped brackets 74, there being a locking screw 76 also suitably coupled with each of the feed control arms 68 and 70 as by a U-shaped bracket 78 whereby said arms 68 and 70 may be locked in the desired position of vertical adjustment.

Crossbar 66 also carries an upstanding, substantially centrally disposed upright 80, which upright 80 has a lever 82 secured to the uppermost end thereof at a pivot point 84, the angularity of lever 82 with respect to upright 80 being adjustable by means of screw 86.

Crossbar 66 also supports a pair of upstanding posts 88, said posts 88 being in spaced-apart relationship as best shown in FIG. 2 of the drawings, there being a post adjacent each of said upright casings 28. Spanning the distance between said posts 88 is a rotatable shaft 90 having its opposed ends suitably journalled in the corresponding post 88. Secured to shaft 90 and depending therefrom are a pair of swingable plates 92 which take the form of elongated strips, the plates 92 extending downwardly from the shaft 90 and each of said plates having a free end 94.

The posts 88, the shaft 90, and the depending plates 92 constitute the essential elements of a shiftable assembly broadly designated as 96, said shiftable assembly being driven by linkage 98 which couples shaft 90 with the driving means of the printing press as is clearly illustrated in FIG. 1 of the drawings, it being preferred that said linkage 98 couple the shaft 90 with the mechanism which drives the ink fountain roller of the printing press. Thus, upon actuation of the printing press, the movement thereof is transmitted through linkage 98 to shaft 90 and thus to plates 92 whereby to swing the same in a predetermined arc for purposes which will become apparent hereinafter.

The feed control arms may be broadly divided into an uppermost portion 100, a lowermost portion 102, and a central portion 104, said portions being so designated because of their relative vertical disposition as is best seen in FIGS. 1 and 4 of the drawings. As is apparent therein, the uppermost portion 100 of feed control arms 68 and 70 extends toward the curved support 32 and is in the path of the envelopes as they move from the conveying means 12 into the feeding mechanism 14 whereby to insure orderly stacking of the envelopes within the feeding mechanism 14.

The lowermost portions 102 of feed control arms 68 and 70 are disposed adjacent the withdrawal cylinder 16 and, as best illustrated in FIGS. 4 and 5 of the drawings, each of said lowermost portions 102 has a tongue 106 formed thereon, said tongues 106 having an arcuate outer edge 107 as best seen in FIG. 5, the tongues each extending into corresponding grooves 108 which are formed on the periphery of the withdrawal cylinder 16. Thus, the lowermost portions 102 of the feed control arms 68 and 70 each have the marginal free end thereof provided with a tongue 106, the tongues 106 having an arcuate outer edge 107, the marginal end of the lowermost portions 102 which have the tongues 105 formed thereon being rounded at one edge thereof as best shown in FIG. 4 and designated as 110, the rounded edge extending the full width of the marginal edge of the lowermost portion 102 of the feed control arms 68 and 70, and said rounded edge 110 being on that portion of the corresponding feed control arm which is proximal to the envelopes when the same are in the feed mechanism 14. The above described arcuate outer edges 107 of the tongues 106 and the rounded edges 110 thereof, through cooperation with the external surface of the withdrawal cylinder 16, insures a smooth and one-at-a-time feed of the envelopes from their stacked positions within the feeding mechanism 14 to the withdrawal cylinder 16.

In this respect, the withdrawal cylinder 16 is substantially identical to that heretofore known and disclosed for instance, in Patent No. 2,853,296, the same being rotatable by a driven shaft 112 and there being a vacuum coupled with the interior of the cylinder 16 as by a tube 114 whereby, as the cylinder rotates and openings thereof, through which a suction is being drawn, pass the stacked envelopes designated as 116, the envelopes are withdrawn from the feeding mechanism 14. To insure the complete passage of the envelopes from stack 116 to the printing portion 18, a series of arcuate guide members 118 are provided, the members 118 depending from the crossbar 66 and cooperating with the cylinder 16 whereby to define a pass 120 through which the envelopes move after their withdrawal from the stack 116, the said envelopes then moving on to a continuous chain which carries the same from a position beneath withdrawal cylinder 116 and into the printing press portion 18 of the unit 10.

The feeding mechanism hereinabove described, works, in conjunction with the described press, in the following manner. The guide arms 24 of conveying means 12 are adjusted to accommodate the same to the length of envelope to be printed as are the upstanding posts 56 and the curved support 32. Adjustments may also include a suitable adjustment of the lever 38; the lever 82; the supporting bar 42; and the feed control arms 68 and 70.

Thus, when the necessary adjustments have been made to accommodate the machine 10 to the particular size of envelope to be printed, a series of envelopes are placed on edge on belt 22 and upon actuation thereof are moved to the right when viewing FIG. 1 of the drawings, the envelopes then being brought into engagement with curved support 32 and disposed between arcuate extensions 30 whereby the same move downwardly toward the withdrawal cylinder 16 and into the feed mechanism 14. As said envelopes move downwardly, their initial fall is in effect broken by a finger 122 carried at the free end of swingable lever 82, which finger has been previously adjusted as by screw 86 whereby to position the same at a point to intercept the forward edge of the envelopes as they move along curved surface 32. It will also be noted that the uppermost portions 100 of the feed control arms 68 and 70 are disposed in the path of the envelopes as they move into the feed mechanism 14, said uppermost portions 100 insuring that the envelopes do not move out of their desired path of travel and that said envelopes move into a neat stacked condition within the feed mechanism 14.

The uppermost portions 100 and the finger 122 tend to urge the envelopes rearwardly or to the left, viewing FIG. 1, whereby the same are maintained in engagement with the curved support 32, it being apparent that the stack of envelopes 116 may reach a height to substantially fill the feeding mechanism 14 although only a portion of such a stack has been illustrated in the drawings.

As the envelopes stack up within the feeding mechanism 14, the rearmost edges thereof as viewed in FIG. 1, engage support plate 42 and the central portion 44 and wings 46 thereof, said support plate functioning to cause the stack of envelopes to incline forwardly or to the right, viewing FIG. 1, whereby the same may be brought into the desired engagement with the withdrawal cylinder 16. In order to insure the proper functioning of support member 42 and that the envelopes move thereagainst and to overcome the tendency of the stack 116 to move to the right as a result of the rotation of cylinder, the plates 92 engage the central section of the stack of envelopes and thereby urge the same toward curved support 32 and thus support plate 42.

Plates 92 are continuously driven through a predetermined arc whereby to effect a "patting" or "jogging" action against the section of the stack of envelopes which are engaged by said plates 92, it being noted that plates 92 have the free ends 94 thereof in a plane above the lowermost portions 102 of the feed control arms 68 and 70 and at a point between the support plate 42 and the fingers 60.

Thus, the envelopes are urged against the support 42 in the manner above described and subsequently pass from a position where they are supported by support 42 along one edge thereof and the withdrawal cylinder 16 along the opposite edge thereof to a point where they are supported by the fingers 60 along said one edge thereof and by the withdrawal cylinder 16 along the other edge thereof, the foregoing being clearly illustrated in FIG. 1 of the drawings. In said drawing, it is clear that that section of the stack of envelopes supported between fingers 60 and withdrawal cylinder 16, are in engagement with the lowermost portion 102 of the feed control arms 68 and 70, it being further noted that the section of the stack of envelopes disposed between the uppermost portions 100 of the feed control arms 68 and 70 and the lowermost portions 102 thereof, are out of engagement with said arms, this being effected by the action of the depending plates 92 as above described.

Inasmuch as withdrawal cylinder 16 is constantly rotating in a clockwise direction viewing FIG. 1, a suction opening will move into engagement with that portion of the lowermost envelope supported by withdrawal cylinder 16, and when this is accomplished, the lowermost envelope is withdrawn from the stack 116 beneath the tongues 106 of the feed control arms 68 and 70 and thence passed along pass 120 and to the means which deliver the same to the printing press portion 18. It has been found that the utilization of the tongues 106 and the fine adjustment thereof with respect to cylinder 16 which may be accomplished by use of screw 72, insures that cylinder 16 withdraws only one envelope at a time from the stack 116, thus preventing jamming of the device 10 and also eliminating the waste of envelopes being withdrawn in numbers of more than one.

Thus, the feed control arms 68 and 70 which form a part of the feeding mechanism 14, cooperate with the shiftable assembly 96 to insure a smooth and continuous flow of envelopes through the feeding mechanism 14 and that the same are withdrawn in an orderly and desirable fashion therefrom for subsequent delivery to the printing press.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Feeding mechanism for an envelope printing press having means for conveying envelopes to the mechanism and means for withdrawing envelopes therefrom and individually delivering the same to the printing press, said mechanism comprising a pair of feed control arms having the normally uppermost portions thereof disposed in the path of the envelopes as the same are conveyed to the mechanism and toward the withdrawal means, the normally lowermost portions of said arms being in engagement with the envelopes in said mechanism adjacent said withdrawal means; and a shiftable assembly for positioning the envelopes in the mechanism as the same pass therethrough, said shiftable assembly including swingable plate means in engagement with the envelopes in said mechanism between said uppermost and lowermost portions of said feed control arms, whereby to move the envelopes between said portions in a direction away from said arms.

2. Feeding mechanism for an envelope printing press having means for conveying envelopes to the mechanism and a grooved, rotatable withdrawal cylinder for withdrawing envelopes therefrom and individually delivering the same to the printing press, said mechanism comprising a pair of feed control arms having the normally uppermost portions thereof disposed in the path of the envelopes as the same are conveyed to the mechanism and toward the withdrawal cylinder, the normally lowermost portions of said arms being in engagement with the envelopes adjacent said withdrawal cylinder, the marginal end of the lowermost portion of each of said arms adjacent said cylinder having a tongue formed thereon in aligned, juxtaposed relationship to a corresponding groove in said cylinder whereby the envelopes are individually withdrawn between said tongues and said cylinder as the cylinder is rotated.

3. Feeding mechanism as set forth in claim 2, wherein said tongues extend into corresponding grooves of the cylinder.

4. Feeding mechanism as set forth in claim 3, wherein the tongues have an arcuate outer edge.

5. Feeding mechanism as set forth in claim 2, wherein the marginal end of said arm having said tongue formed thereon has one edge thereof rounded.

6. Feeding mechanism as set forth in claim 5, wherein said rounded edge is the edge proximal to said envelopes when the same are in said mechanism.

7. Feeding mechanism for an envelope printing press having driving means, means for conveying envelopes to the mechanism and means for individually withdrawing the same therefrom, the envelopes being in stacked relation when in said mechanism, said mechanism comprising means for supporting the stack of envelopes on one side thereof; and a jogging assembly adjacent said withdrawal means and in intermittent engagement with the opposite side of the stack of envelopes whereby to urge the same toward said support means.

8. Feeding mechanism as set forth in claim 7, wherein said jogging assembly includes at least one swingable plate; a shaft carrying said plate; and linkage coupling said shaft with the driving means for the printing press whereby said plate is swung through a preselected arc.

9. Feeding mechanism as set forth in claim 8, wherein said support means includes a centrally disposed, transversely arcuate support plate and auxiliary supporting fingers disposed below said support plate.

10. Feeding mechanism as set forth in claim 9, wherein said swingable plate depends from said shaft, the lowermost free end of said plate being in a plane spaced below said support plate and above said withdrawal cylinder.

11. Feeding mechanism as set forth in claim 10, wherein said lowermost free end lies in a plane between said support plate and said fingers.

12. Feeding mechanism for an envelope printing press having driving means, means for conveying envelopes to the mechanism and an externally grooved withdrawal cylinder for withdrawing envelopes therefrom and in-

dividually delivering the same to the printing press, said mechanism comprising a crossbar carried by said press above said cylinder; a pair of arcuate feed control arms adjustably carried by said crossbar, the normally uppermost portions of said arms above said crossbar being disposed in the path of envelopes as the same are conveyed to the mechanism and toward the withdrawal cylinder, the normally lowermost portions of said arms below said crossbar and proximal to said cylinder being in engagement with the envelopes adjacent said cylinder; a shiftable assembly supported by said crossbar and including a shaft, a pair of plates depending therefrom and linkage coupling said shaft to the printing press drive means whereby to swing said plates through a preselected arc, said plates intermittently engaging those envelopes in the mechanism disposed between said uppermost and lowermost portions of the arms whereby to urge the same away from said arms; and support means disposed in opposed spaced relationship to said arms and said plates and including an uppermost support plate and a set of lowermost supporting fingers.

13. Feeding mechanism for an envelope printing press



having a grooved, rotatable withdrawal cylinder for withdrawing envelopes from the feeding mechanism and individually delivering the same to the printing press, said mechanism comprising at least one arm for controlling the feed of the envelopes through the mechanism toward the cylinder; a tongue formed on the end of said arm proximal to said cylinder, said tongue being aligned with a corresponding groove in said cylinder; and means mounting said arm for movement of said tongue to and from a position within said corresponding groove.

14. Feeding mechanism as set forth in claim 13, wherein said tongue has an arcuate outer edge.

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