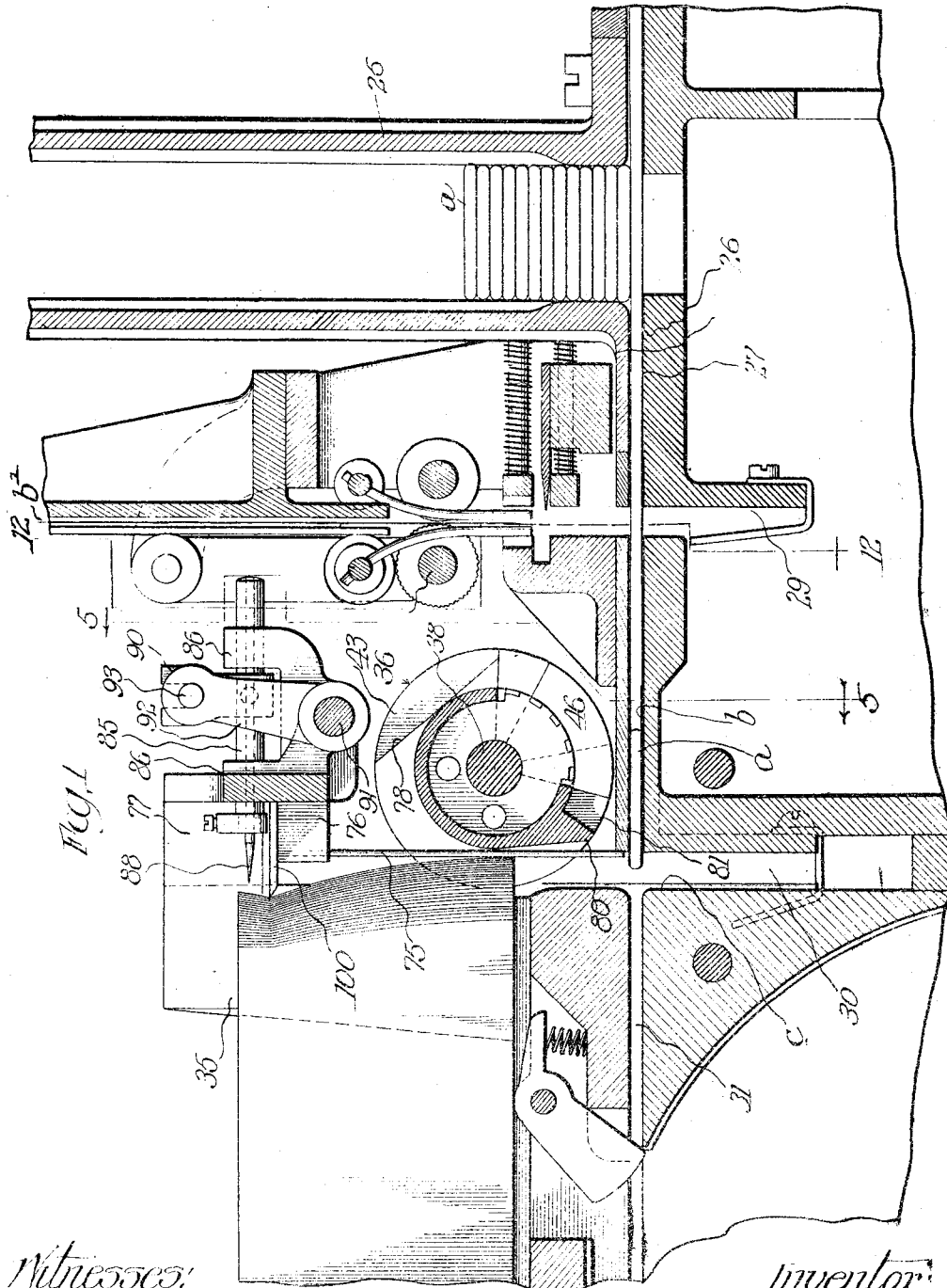


H. Y. ARMSTRONG.
WRAPPER FEED MECHANISM FOR WRAPPING MACHINES.
APPLICATION FILED OCT. 9, 1909.

1,051,477.

Patented Jan. 28, 1913.

5 SHEETS—SHEET 1.



Witnesses:
Harold S. Barrett
W. Goldberger

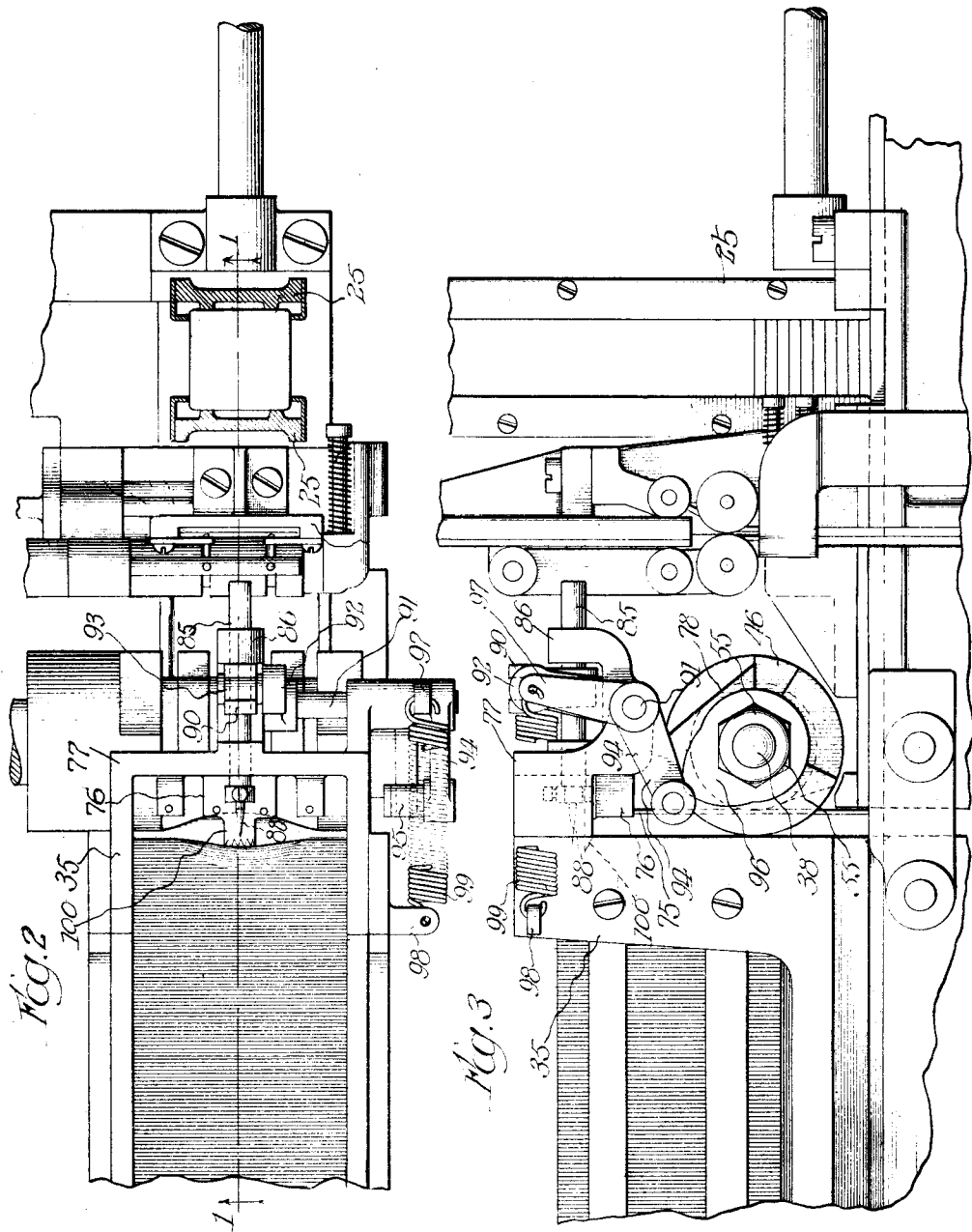
Inventor:
Harry Y. Armstrong
by William H. Hall, Atty

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Witnesses:
Harold E. Barnett
W. Goldberger

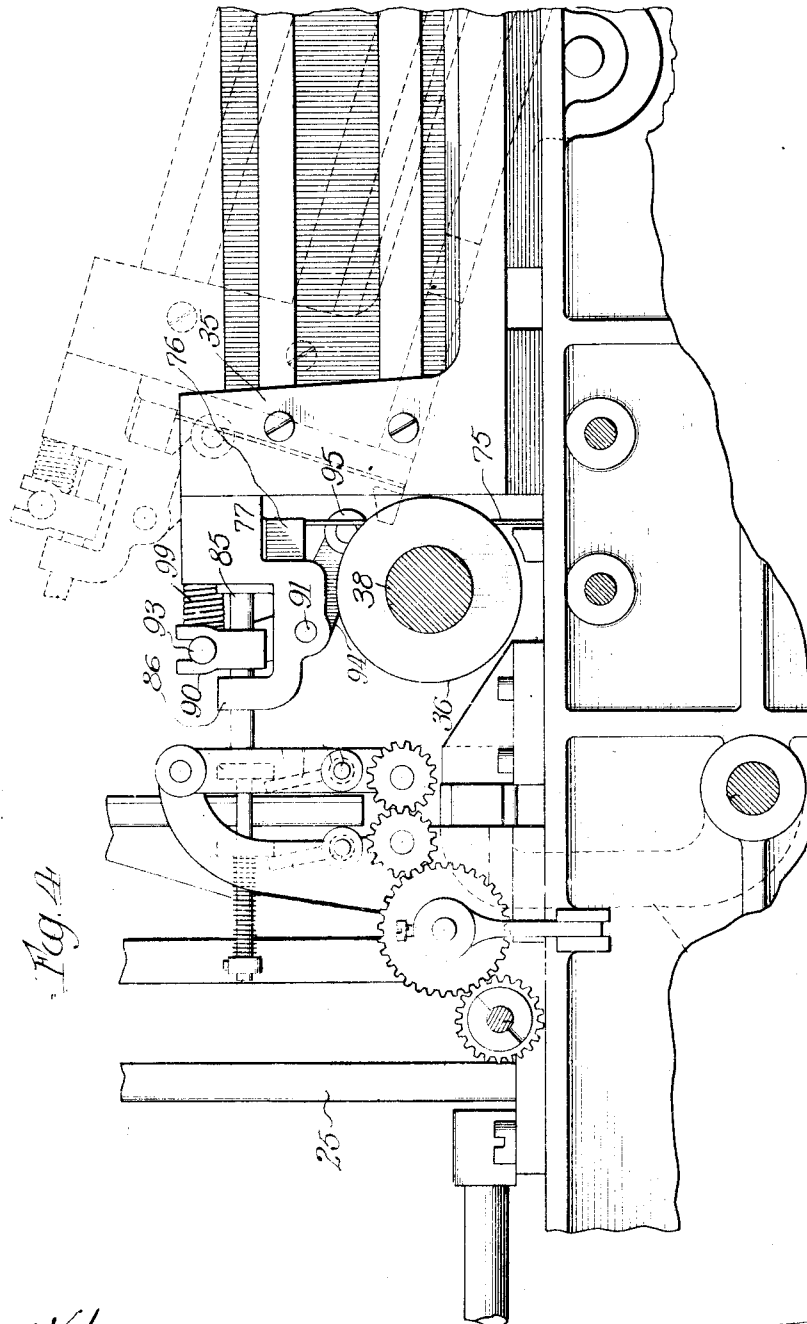
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5 SHEETS—SHEET 3.



Witnesses:
Harold G. Bantz
W. Goldberger

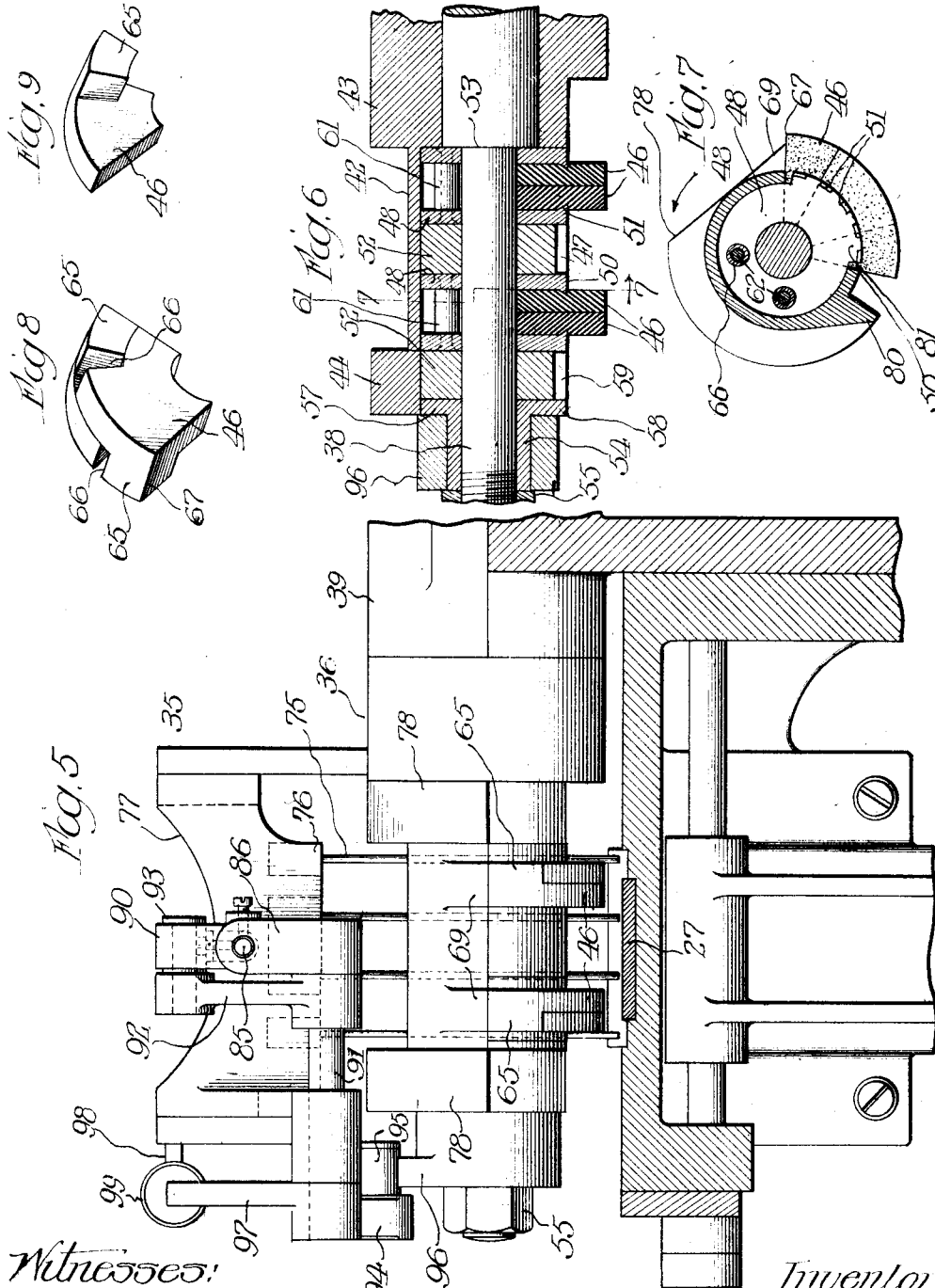
Inventor:
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5 SHEETS—SHEET 4.



Witnesses:
Harold C. Barnett
W. Goldberger

Inventor
H. Y. Armstrong
by William H. Hall Atty.

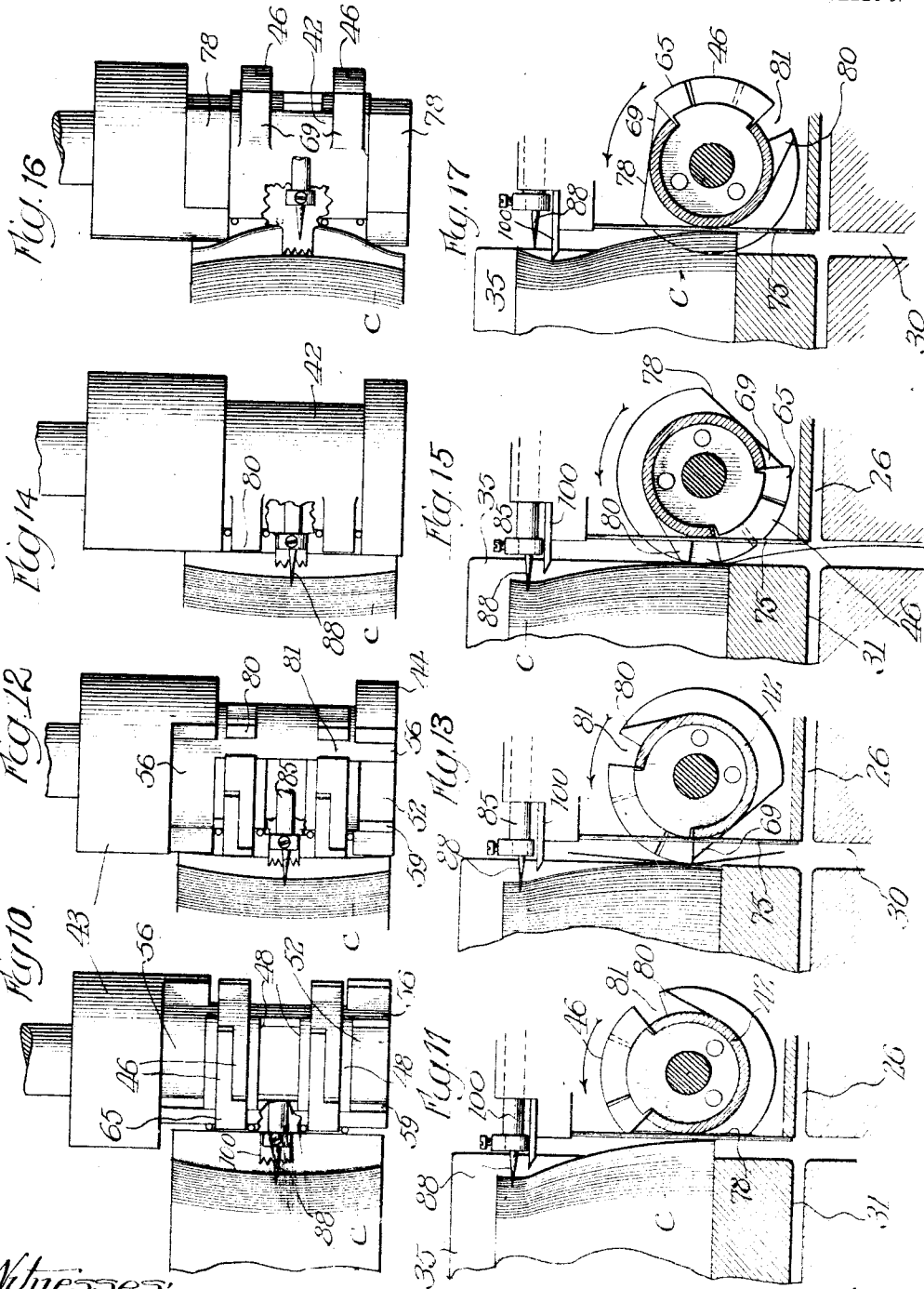
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5 SHEETS—SHEET 5.



Witnessed:
Karl G. Baumbach
W. Goldberger

Inventor:
Harry Y. Armstrong
by William H. Abel, atty.

UNITED STATES PATENT OFFICE.

HARRY YARRINGTON ARMSTRONG, OF ELGIN, ILLINOIS, ASSIGNOR TO ARMSTRONG WRAPPING MACHINE COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION OF KENTUCKY.

WRAPPER-FEED MECHANISM FOR WRAPPING-MACHINES.

1,051,477.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed October 9, 1909. Serial No. 521,634.

To all whom it may concern:

Be it known that I, HARRY Y. ARMSTRONG, a citizen of the United States, and a resident of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Wrapper-Feed Mechanism for Wrapping-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to wrapper or sheet feeding mechanisms for wrapping machines and other uses designed, for instance, to deliver wrappers to a wrapping mechanism by which the wrappers are wrapped about the articles.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

My improved sheet or wrapper delivery mechanism is herein shown as designed for use with a wrapping machine, such as is shown in my prior United States Letters Patent, Number 890,953, granted June 16, 1908, and Number 918,641, granted April 20, 1909.

The wrapper feeding mechanism embraces in its complete assemblage as applied to the machine illustrated, means for feeding both an inner and an outer wrapper into the path of an article to be wrapped. The outer wrapper feeding means embrace means for separately stripping individual wrappers or sheets from a bundle held compactly in a suitable holder or magazine and feeding them to a wrapper recess beneath the magazine into the path of the article to be wrapped.

The invention relates also to a novel stripping roller for stripping the sheets or wrappers from the bundle. It further relates to an improved means for preventing more than one wrapper at a time being stripped from the bundle.

Certain of the features of my improvements may be applied to other machines than wrapping machines to feed sheets in consecutive order, in the general manner set forth, and the mechanism may be used in

whole or in part in any given adaptation of the improvements to sheet feeding mechanisms.

As shown in the drawings, Figure 1 is a vertical sectional view of a sheet feeding mechanism made in accordance with my invention. Fig. 2 is a plan view thereof, with parts in section. Fig. 3 is a side elevation. Fig. 4 is an elevation of the opposite side of the mechanism, parts being shown in section. Fig. 5 is a vertical section on the indirect line 5—5 of Fig. 1, looking in the direction indicated by the arrow. Fig. 6 is an axial section of the stripper roller for stripping the individual sheets or wrappers from the sheet holding means. Fig. 7 is a transverse section on the line 7—7 of Fig. 6. Figs. 8 and 9 are details of the friction elements of the stripper roller. Figs. 10 to 17, both inclusive, are plan views and vertical sectional views, illustrating the operation of the stripper roller to strip the individual wrappers or sheets from the magazine or other holding means, as will hereinafter be described, the construction being more or less diagrammatically shown in these figures.

Only such parts of the wrapping machine proper are herein shown as will facilitate an understanding of the application of my invention thereto, said machine being fully shown in my aforesaid Letters Patent, Number 890,953 and Number 918,641.

25 designates a hopper for a vertical stack of gums *a* or other articles to be wrapped, from the lower end of which the gums are discharged into a way 26 by means of a plunger 27 that reciprocates through said lower end of the hopper. Said way 26 extends over two wrapper receiving recesses 29 and 30 into which wrappers are deposited by the wrapper feeding mechanisms, the delivered wrappers extending at their upper sides across the way into the path of the gums so as to be partially folded about the gums as they are advanced through the way and through a continuation 31 of said way that constitutes part of the wrapping mechanism, as set forth in my aforesaid prior patents. The recess 29 receives the thin inner wrappers *b* discharged therinto by the strip cutting mechanism above, and the

recess 30 receives the outside wrappers or sheets *c* that are fed thereinto by the sheet feeding means thereabove, and hereinafter to be described.

35 designates, as a whole, a horizontal magazine, disposed longitudinally of the machine, for containing the outer wrappers *c*, said wrappers being arranged vertically on edge in a compact group in the magazine and contained between a stripper roller 36 at the front end of the magazine and a suitable pressure device (not shown) at the rear end of the magazine. A form of pressure device suitable for this purpose is shown in my prior U. S. Patent, No. 890,953 dated June 16, 1908, comprising a follower in rear of the group of wrappers placed under the influence of a weight tending to press it and the wrappers toward the stripper roller 36. Said magazine is in position to hold the outermost wrappers therein over the outer wrapper receiving recess 30 in such manner that the outer wrappers or sheets are delivered by said stripper roller directly and vertically from the magazine into said recess.

The stripper roller 36 is fixed to a horizontal rotative shaft 38 which is mounted in suitable bearings in the machine (not shown). The stripper roller is of special construction, and is more clearly shown in Figs. 1, 6, 7, 8, 9 and 10 to 17, both inclusive, and constitutes one of the features of the present invention. The said roller is so arranged as to be rotated continuously and to effect an intermittent stripping or withdrawal of the wrappers from the magazine and deposit them in the wrapper recess 30 below. It comprises a generally cylindric shell 42 having end enlargements or flanges 43, 44. The flanges have smooth faces which bear throughout the principal parts of their exterior faces against the wrappers at the side margins of the latter. The gripping portion of the stripper roller embraces friction surfaces which are formed on the curved or cylindric faces of friction blocks 46, 46 that are set into an opening 47 at one side of the central or smaller portion of the hollow shell and are held between clamping disks 48, 48 that are fitted over the shaft 38, within the shell and are clamped or pressed against the friction blocks. Said blocks may be made of rubber or like material. As herein shown two pairs of friction blocks 46 are employed, the blocks of each pair fitting flat against each other, with two clamping disks 48 engaging their outer sides to press them together. The said clamping disks are made of a diameter to transversely fill the cylindric shell and have eccentric extensions 50 that extend through the opening in the shell and are provided with teeth or projections 51 that are embedded into the friction blocks 46 to more securely hold the latter in

place, as shown in Figs. 6 and 7. The said clamping disks are spaced from each other and the outer end of the roller by thick spacing rings 52, 52 fitted over the shaft within the shell. The parts are confined from displacement, endwise of the roller, between a shoulder 53 on the shaft 38 and a follower sleeve 54 surrounding the outer end of the shaft, said follower sleeve being forced inwardly by means of a nut 55 that is screw-threaded to the outer end of the shaft 38.

The flanges or enlargements 43, 44 of the stripper roller are cut away at 56, 56 in line with the opening 47 of the smaller part of the roller through which the friction blocks extend, the said flanges being reduced to the diameter of the smaller part of the roller, as shown in Figs. 6, 10 and 12. The removal of the flanges or enlargements to constitute the recesses 56, is for the purpose of giving the friction surfaces of the roller freest possible action on the wrappers, the friction blocks being the only parts that project beyond the roller in the part of the roller occupied by the wrapper engaging faces of said blocks.

The follower sleeve 54 is provided at its inner end with a flange 57 that bears against the outermost spacing ring 52, and said flange has at one side thereof an eccentric portion 58 which fits a notch 59 in the flange 44 in line with the opening 47, through which notch 59 the eccentric portions of the clamping rings are adapted to pass when assembling the parts in the roller. The engagement of the eccentric portion 58 of the flange 57, with the notch 59 serves also to lock the follower sleeve from rotation relatively to the roller, as will be obvious. In order to space the clamping disks 48 at their sides remote from the friction blocks, I provide spacing tubes 61, 61 which fill the spaces between the inner faces of companion clamping disks, and said tubes may be held in place by short rivets 62, 62 extending therethrough and riveted or otherwise fixed to said disks.

It will be noted that the curved gripping faces of the friction blocks 46, constituting parts of said roller, lie approximately in the circumferential line of flanges or enlargements of the metal portion of the wheel at the greatest radii of said enlargements. The said friction blocks thus constitute the effective gripping surfaces of the roller, the remaining portions of the roller, which contact with the wrappers or sheets *c*, being smooth, polished surfaces of the flanges or enlargements which do not operate to strip or drag the sheets from the magazine.

The friction blocks are each shown as provided at the intersection of one of its end or radial margins and its curved margin with a lateral offset portion or extension 65 (Figs. 130

5, 8 and 9) arranged to fit in a recess or notch 66 in the corresponding end of a mating friction block. The projection 65 of each block is made of a lateral thickness equal to the marginal thickness of the companion friction block, so that when the blocks are interfitted in the roller the gripping margins of said blocks are laterally offset, as more clearly shown in Figs. 5, 8 and 9, with the projection of each block of a pair in the plane of the main marginal portion of the other block. The purpose of this arrangement will be understood from a consideration of the following: The advance ends of the friction blocks or elements, considered with respect to the direction of rotation thereof, are subject to relatively severe wear, owing to the fact that they first strike the wrappers or sheets, when rotating downwardly against the same, as indicated in Fig. 13. Such wearing of the advance ends of the blocks cuts away the corners 67 so as to bring them radially inside the general circumference of the roller, thereby delaying the stripping action of the roller to an extent corresponding to the shortening of the friction surface. When such wear occurs, the blocks may be removed and the advance ends thereof cut backwardly a sufficient distance to remove the worn corner thereof and to present another sharp corner 67. When the blocks are replaced they are angularly adjusted with respect to each other to advance the forward projections 65 a distance equal to the length of the portions so cut away, and thereby properly position or fix the freshly cut gripping corners. The position of the advance ends of the gripping blocks is fixed by means of gage lugs or projections 69 on the smaller diameter of the stripper roller, as shown in Fig. 5 and 7, which terminate at their ends just short of the gripping corners 67. The lateral overlapping arrangement of the blocks permits of such arrangement without materially breaking the lateral continuity of the curved friction surfaces, and also without shortening the length of the friction surfaces, circumferentially of the roller. This latter feature would appear if the laterally overlapping lugs be not present; that is to say, the friction elements or block may be plain and arranged side by side in longitudinal overlapping relation, without the lateral offset relation. Such adjustment may be repeated from time to time until the forward projections or offsets 65 are entirely cut away, after which the blocks may be reversed in their positions to present the other, or formerly trailing projections or offsets for a like use and adjustment. The said stripper roller rotates continuously. When the metal portion of the roller engages with the outermost wrapper or sheet in the magazine, the friction between the same and the wrapper

is not sufficient to remove the wrapper from the bundle, but said wrapper is stripped during the time the curved faces of the friction blocks or elements of the roller pass in contact with the exposed wrappers of the group.

Extending downwardly between the stripper and the wrappers in the magazine, and located out of the planes of the friction blocks are guide wires 75, 75 which are fixed at their upper ends to and extend downwardly from lugs 76 of a frame 77 extending forwardly from and supported on the magazine. Said guide rods extend almost to the feed slot (Fig. 1) and prevent the wrappers clinging to the face of the roller and thereby insure the proper guidance of the said wrappers into the wrapper recess 30.

In order that the advance ends of the friction gripping blocks may freely engage with the sheets or wrappers as the roller turns downwardly toward them, and for a further reason hereinafter to be described, the end flanges or enlargements 43, 44 of said roller are obliquely cut away in front of said advance ends of the friction blocks, as shown at 78, to a plane substantially tangent to the curved face of the smaller diameter of the block.

The smaller part of the roller is provided at the rear ends of the friction gripping blocks with lugs 80 that are located with their outer ends in the circumferential line of the cylindric bearing faces of the flanges and the gripping friction blocks. The said lugs are located a distance in rear of the rear ends of the friction blocks so as to leave spaces 81 between the lugs and the rear ends of said blocks. The purpose of said lugs, thus spaced from the rear ends of the friction blocks, will be hereinafter described.

In order to prevent more than one wrapper from being stripped from the bundle at a time, provision of a holding or retarding device is made which is located near the top of the magazine, when the wrappers or sheets are stripped from the bottom thereof, and which is so arranged as to permit the outermost wrapper to be stripped from the bundle, but to prevent the next wrapper inside the same from being simultaneously removed. The mechanism for this purpose herein shown is made as follows: 85 designates a horizontally reciprocating plunger in front of the magazine which reciprocates in guide bearings 86, 86 integral with or carried by the frame 77. The plunger carries at its forward end a needle 88 which is arranged to penetrate the two or more outermost wrappers *c*, near their upper margins. When said needle is thus engaged with the wrappers the outermost wrapper is torn to release it from the needle when the wrapper is stripped from the bundle, but the needle affords such resistance to the re-

moval of the second wrapper as not to be overcome by the friction of the wrapper being withdrawn upon the second wrapper.

In order to prevent bits of paper torn from the sheets or wrappers clinging to the point of the needle, provision is made for giving the needle a movement such as will clear the needle point of bits of paper, and such movement involves a reversal of direction, as for instance, a reciprocating movement. As herein shown this movement is an endwise reciprocating movement and it is effected as follows: 90 designates a block that is keyed or otherwise secured to the plunger 85. 91 designates a rock shaft which is mounted in bearings in the frame 77 and is provided with an arm 92 having at its upper end a laterally extending bearing pin 93 that is adapted to engage in an upwardly opening notch in the block 90. Fixed to the end of the rock shaft is a downwardly extending arm 94 that is provided with a laterally extending roller 95 which rides on the periphery of a cam 96 that is fixed to the stripper roller shaft 38 between the nut 55 and the flanged end 44 of the roller. Extending upwardly from the hub of the arm 94 is a third arm 97, between the upper end of which and a lug 98 fixed to the magazine, extends a spring 99 which tends to hold the pin in its rearmost position (penetrating the wrappers) and to hold the bearing roller 95 against its cam. Located below the needle is a horizontally arranged, fixed plate 100 which is notched at its rear end to engage the outermost wrapper when the needle is withdrawn, and thereby hold the wrappers or sheets at this time in proper grouped relation in the magazine.

The operation of the stripping mechanism will be understood from an inspection of Figs. 10 to 17, both inclusive. In Figs. 10 and 11 is illustrated the positions of the stripper roller and the retarding needle just before the front ends of the friction elements of the roller engage with the outermost wrapper to strip it from the bundle. At this time the needle penetrates the first few wrappers of the bundle at their upper margins and holds the bundle pressed inwardly, the upper margins of the wrappers assuming a concave outline. The lower ends of the wrappers or sheets at this time spring outwardly, entirely across the magazine, which is permitted by reason of the fact that the cut-away portions 78 of the roller flanges are turned toward the bundle. In Figs. 12 and 13 are shown the position of the parts when the roller has advanced with the forward ends of the gripping blocks engaged with a sheet or wrapper which it is in the act of removing. An inspection of said Fig. 13 illustrates the manner in which the front ends of said friction

blocks engage the sheet, and this engagement continues until the sheet is removed entirely from the bundle. Figs. 14 and 15 illustrate the stripper roller at about the end of its stripping movement, or when the rear ends of the friction blocks are moving away from the bundle in the magazine. When the roller is in this position the lugs 80 are brought into contact with the next sheet to be withdrawn, just above the upper edge of the sheet being withdrawn, in a manner acting to hold or retard the inner sheet and prevents said sheet coming into the influence of the friction blocks, and acts also to facilitate freeing the upper margin of the sheet being withdrawn from the friction surface of the roller. During the movement of the stripper roller as illustrated, and as thus far described, the needle 88 remains in its rearward position, engaged with the sheets or wrappers and holds the upper margins of the wrappers concave in plan view. After the friction side of the roller has passed the bundle and the lower side of the outermost sheet is engaged only at its margins by the smooth roller flanges, the needle 88 is withdrawn, under the action of the cam 96 and the mechanism operated thereby. When the needle is so withdrawn the upper portions of the sheets, theretofore pressed inwardly by the needle, as indicated in Figs. 10, 12 and 14, spring forwardly, as indicated in Fig. 16, into engagement with the notched edge of the plate 100, which latter prevents the sheets from losing their positions in the magazine. The withdrawal of the needle and its subsequent penetration of the sheets, which occurs once during each rotation of the stripper roller, has the effect to keep the point of the needle clear of fragments of paper torn from the wrappers. The action of the roller on the wrappers, combined with the withdrawal of the needle from and its insertion into the wrappers, has the effect to loosen the mass of wrappers at the delivery end of the magazine and prevent them from sticking or adhering to each other, so that they may be readily withdrawn when the gripping surfaces of the roller strikes the same, as will be evident from an inspection of Figs. 10 to 17, both inclusive.

In practice the wrappers or sheets become enmeshed or adhere together at their surfaces under the pressure to which they are subjected when cut from a plurality of superposed sheets. The surface fibers of the interleaved sheets are pressed into each other. The loosening of the sheets in the manner shown and described permits air to circulate between the sheets and the movement of the sheets upon each other with air between the same has the effect to readily free the sheets from each other. The magazine is pivotally mounted on its support so that it

may be tipped upwardly at its inner end into the position shown in dotted lines in Fig. 4 to facilitate loading the magazine with wrappers.

5 I claim as my invention:

1. The combination with a magazine located above a horizontal way, a sheet receiving recess intermediate and transversely intersecting said way, said magazine being adapted to contain sheets or wrappers arranged on edge, and with one end arranged directly over said recess, and means for holding the wrappers in a compact bundle in said magazine, of a rotative stripper roll against which the bundle of wrappers is adapted to be pressed provided with a gripping surface adapted for engagement with the end sheets or wrappers of said bundle, and arranged to strip the sheets or wrappers directly from said bundle into said recess without change of direction, and means engaging the upper marginal parts of the first few outermost wrappers to prevent the stripping of more than one wrapper at a time.

2. The combination with means for holding a compact bundle of sheets, of a stripper roller for stripping the sheets one at a time from said bundle comprising a shell having a smooth exterior surface and provided at one side with a longitudinal opening and separately formed friction members arranged side by side in said shell and having curved margins exposed through said longitudinal opening and constituting the gripping surface of the roller, with clamping means acting longitudinally of the roller for holding the friction members in place.

3. The combination with means for holding a compact bundle of sheets, of a stripper roller comprising a hollow shell having a smooth exterior surface for contact with the sheets and provided at one side with a longitudinal opening, friction members in said shell having curved margins exposed through said opening to constitute the segmental gripping surface of the roller and clamping disks acting longitudinally of the shell between which said friction members are clamped.

4. The combination with means for holding a compact bundle of sheets, of a stripper roller comprising a hollow shell having a smooth exterior surface for contact with the sheets, a shaft extending axially through the shell, said shell being provided at one side with an opening, clamping devices arranged on said shaft and friction members in the shell with means for angularly adjusting them relatively to each other and clamped between the clamping devices and having curved margins exposed through said opening to constitute the gripping surface of the roller, said friction members comprising flat bodies arranged side by side,

one of which is provided at its initial biting surface with a lateral extension or thickened portion that overlaps an adjacent friction member.

5. The combination with means for holding a compact bundle of wrappers, of a stripper roller comprising a hollow shell provided with end enlargements having smooth exterior cylindric surfaces for contact with the sheets, the roller being provided at one side with a longitudinal opening, friction members in said shell having curved margins exposed through said longitudinal opening and constituting the gripping surface of the roller, the curved margins of said friction members being arranged on the same circumference as the cylindric surfaces of the enlargements of the shell, and the shell being cut away at its ends in line with said friction members to afford free contact of the friction members with the sheets.

6. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindrical ends and a reduced central portion, the latter provided with a longitudinal opening, friction members extending through said opening and removably fixed in the reduced central hollow portion of the roller and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller.

7. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindrical ends and a reduced central portion, the latter provided with a longitudinal opening, friction members extending through said opening and removably fixed in the reduced central portion of the roller and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller, there being gage lugs on the exterior of the reduced portion of the roller for locating said friction members.

8. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening, flat friction members extending through said opening and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller, said friction members being arranged flatwise together in pairs and the pairs spaced apart longitudinally of the roller.

9. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening, friction members extending through said opening and removably fixed in the reduced central

portion of the roller and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller, and the members of each pair lying flatwise together and adjustable relatively to each other in their planes.

10. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening, flat friction members extending outwardly through said longitudinal opening and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller, said friction members being arranged in spaced pairs with the members of each pair lying side by side and arranged to be angularly adjusted relatively to each other in their planes, and gage lugs on the reduced part of the roller against which the front margins of the friction members bear, the gage lugs terminating short of the curved margins of said friction members.

11. The combination with means of holding a compact bundle of sheets, of a hollow stripper roller provided with a longitudinal opening, flat friction members extending outwardly through said longitudinal opening and provided with curved margins arranged to constitute the segmental gripping surface of the roller, a shaft extending axially through the roller, clamping disks surrounding the shaft between which the friction members are clamped together, a follower sleeve surrounding the shaft at the outer end of the roller and cooperating with means for pressing it toward said clamping disks and spacing sleeves for spacing the friction members longitudinally of the roller.

12. The combination with means for holding a compact bundle of sheets, of a hollow stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening, flat friction members extending outwardly through said longitudinal opening and provided with curved margins which lie in the circumferential line of the enlarged ends of the roller, a shaft extending axially through the roller, clamping disks arranged in pairs and surrounding the shaft and between which are clamped the friction members, and spacing means for spacing the friction members longitudinally of the roller, said clamping disks having eccentric parts which extend outwardly into said longitudinal opening and said eccentric parts being provided with projections or teeth adapted to be pressed into the friction members.

13. The combination with means for holding a compact bundle of sheets, of a hollow stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening,

a shaft extending axially through said roller, segmental friction members lying at their inner smaller ends against the shaft and extending outwardly through said longitudinal opening and formed with outer curved margins that lie in the circumferential line of the enlarged ends of the roller, clamping disks surrounding said shaft within the hollow roller, said disks being arranged in pairs and arranged to be clamped upon the friction members to hold the latter in place in the roller, means for spacing the pairs of said disks apart and spacing means interposed between the disks of each pair on the side of the shaft remote from the clamping members.

14. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends and a reduced central portion, and means forming on said reduced portion a curved segmental friction surface which lies in the circumferential line of the enlarged cylindric ends of the roller, the reduced portion of the roller being provided with a raised lug or projection which is spaced a distance from the rear end of said friction surface.

15. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends and a reduced central portion, the latter provided with a longitudinal opening, and friction members spaced longitudinally of the roller and extending outwardly through said opening and formed with outer curved segmental surfaces which lie in the circumferential line of the enlarged ends of the roller and constituting the gripping surfaces of the roller, the reduced portion of the roller being provided with lugs or projections spaced a distance from the rear ends of said friction members.

16. The combination with means for holding a compact bundle of sheets, of a stripper roller having enlarged cylindric ends which bear against the foremost sheet of the bundle and a reduced central portion, and provided at its reduced portion with segmental friction members having curved margins which lie in the circumferential line of the enlarged ends of the roller, said enlarged ends of the roller being cut away in front of the friction members in a manner to freely expose the front ends of the gripping members to the sheets.

17. The combination with means for holding a compact bundle of sheets, of a stripper roller acting against the sheets at one margin thereof for stripping the sheets one at a time from the bundle and irregularly formed to permit movement of the sheets toward and from the bundle to loosen the interleaved sheets, a needle reciprocable toward and from the sheets and adapted to

penetrate the first few sheets near the opposite margin thereof, and a fixed stop against which the latter margins of the sheets spring when the needle is withdrawn.

5 18. The combination with means for separately removing sheets from a group of sheets, of a needle reciprocable toward and from the group and adapted to penetrate the first few sheets near one margin thereof, and a fixed stop against which the sheets 10 spring at the latter margin when the needle is withdrawn.

19. The combination with means for holding a compact bundle of sheets, of a stripper 15 roller for removing the sheets one at a time,

said roller having enlarged ends which bear against the foremost sheet of the bundle and having a reduced intermediate portion, and segmental friction means within said reduced portion between said enlarged ends, 20 said ends being segmentally cut away out of line with the friction means.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 28th day of 25 September A. D. 1909.

HARRY VARRINGTON ARMSTRONG.

Witnesses:

W. W. HALL,

G. R. WILKINS.