

Feb. 3, 1959

G. W. FRENCH

2,872,190

SHEET FEEDING AND STACKING APPARATUS

Filed Sept. 13, 1955

6 Sheets-Sheet 1

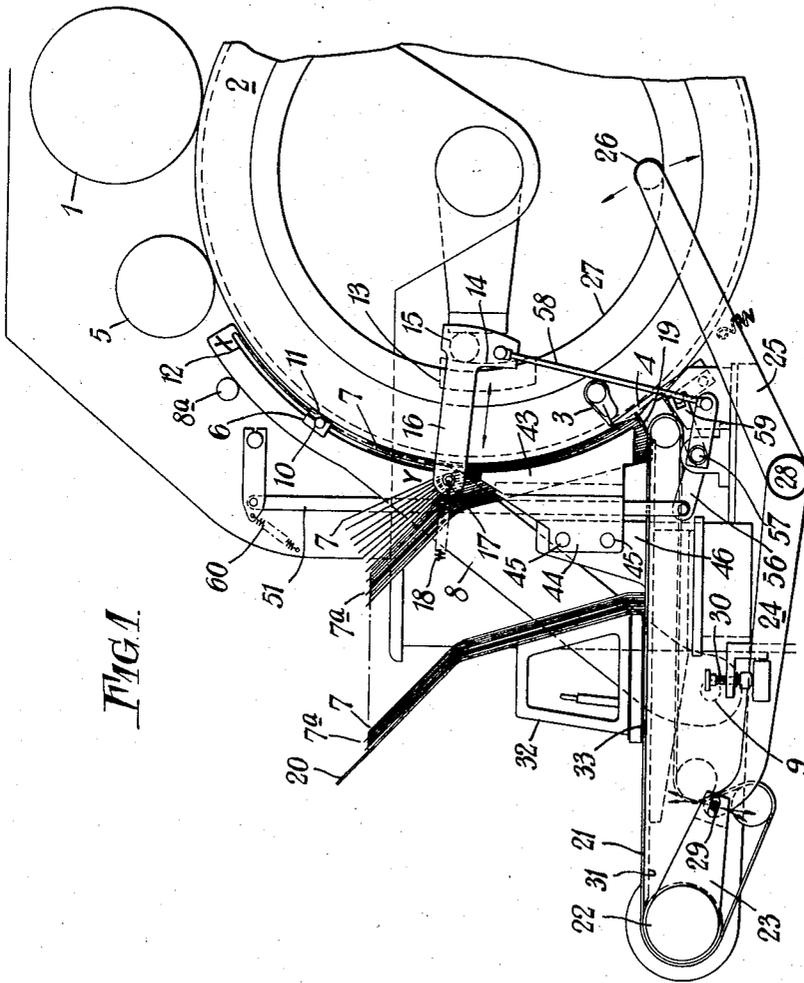


FIG. 1

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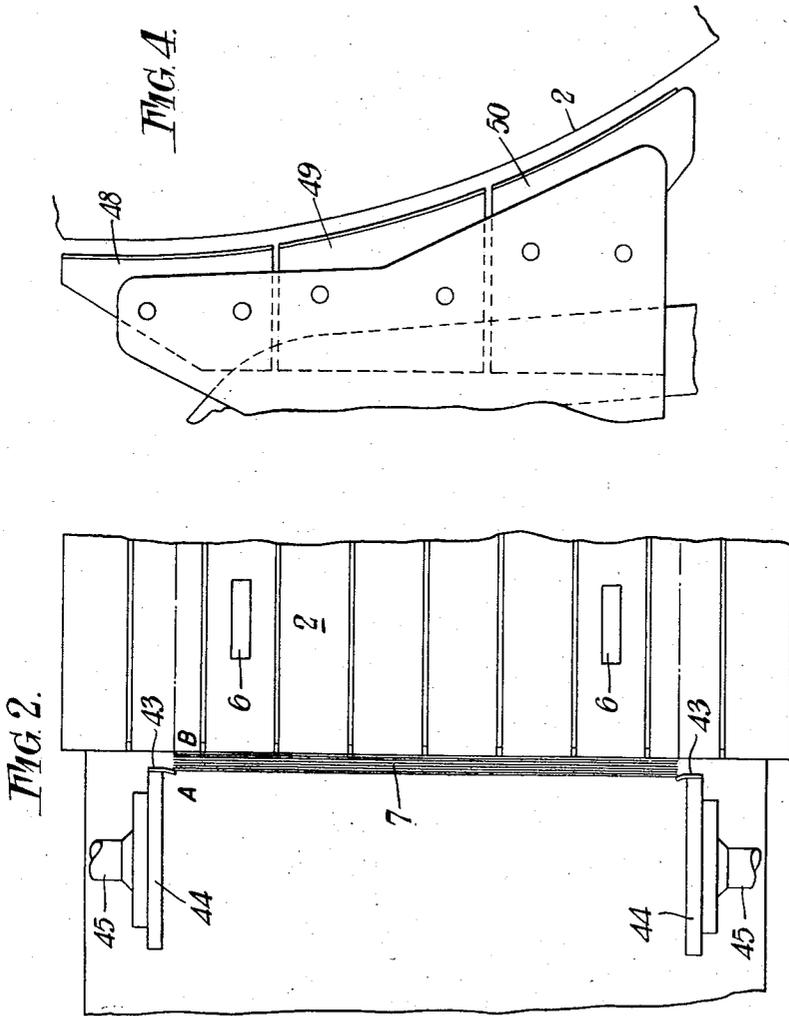
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6 Sheets-Sheet 2



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6 Sheets-Sheet 3

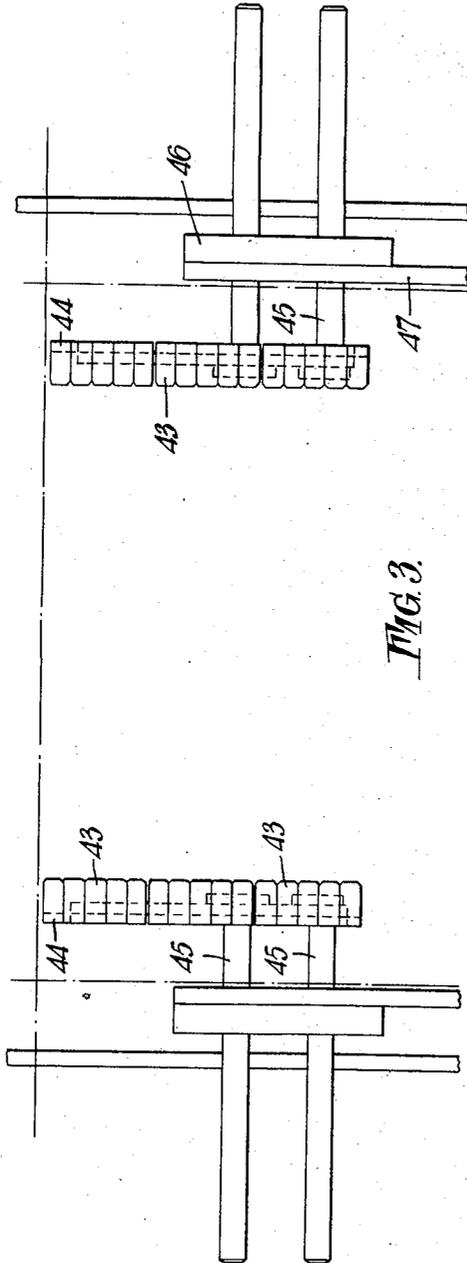


FIG. 3.

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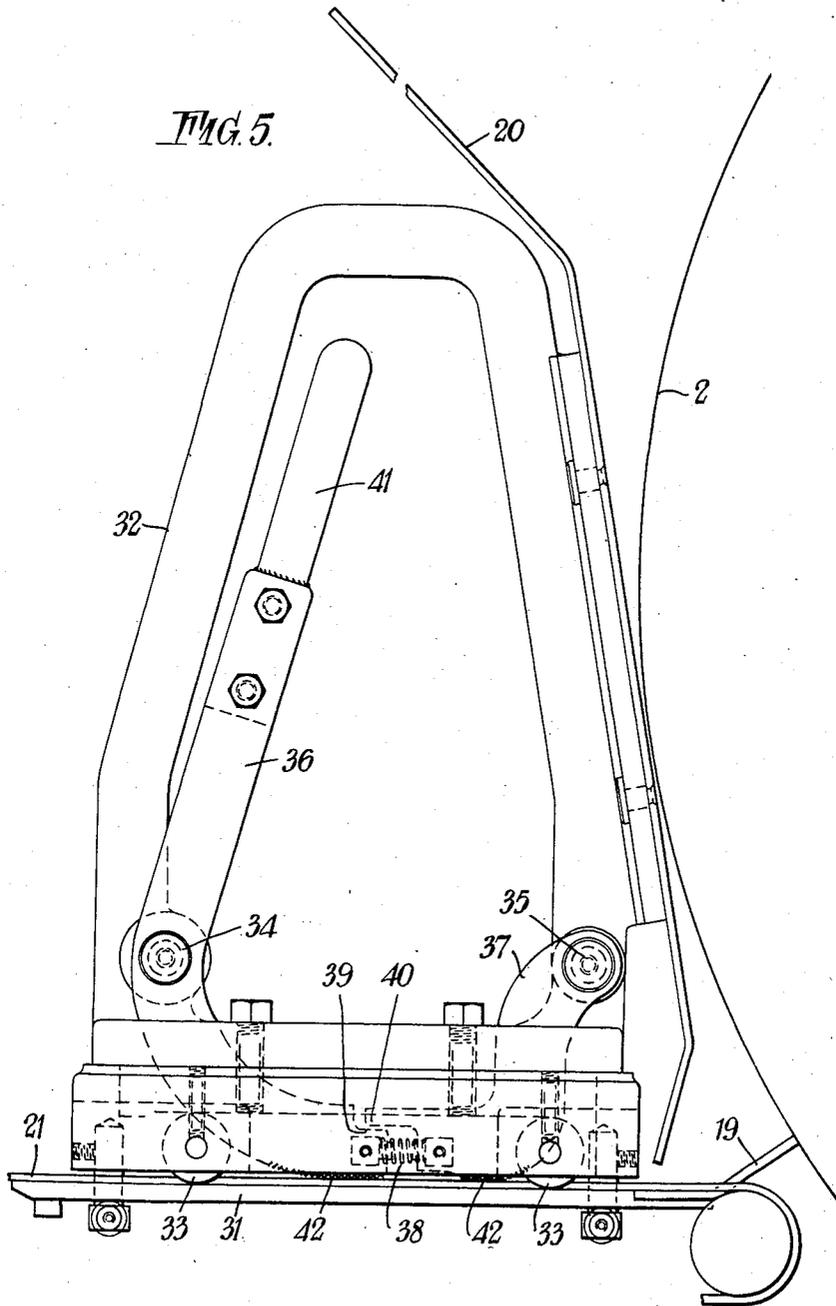
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SHEET FEEDING AND STACKING APPARATUS

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6 Sheets-Sheet 4



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SHEET FEEDING AND STACKING APPARATUS

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6 Sheets-Sheet 5

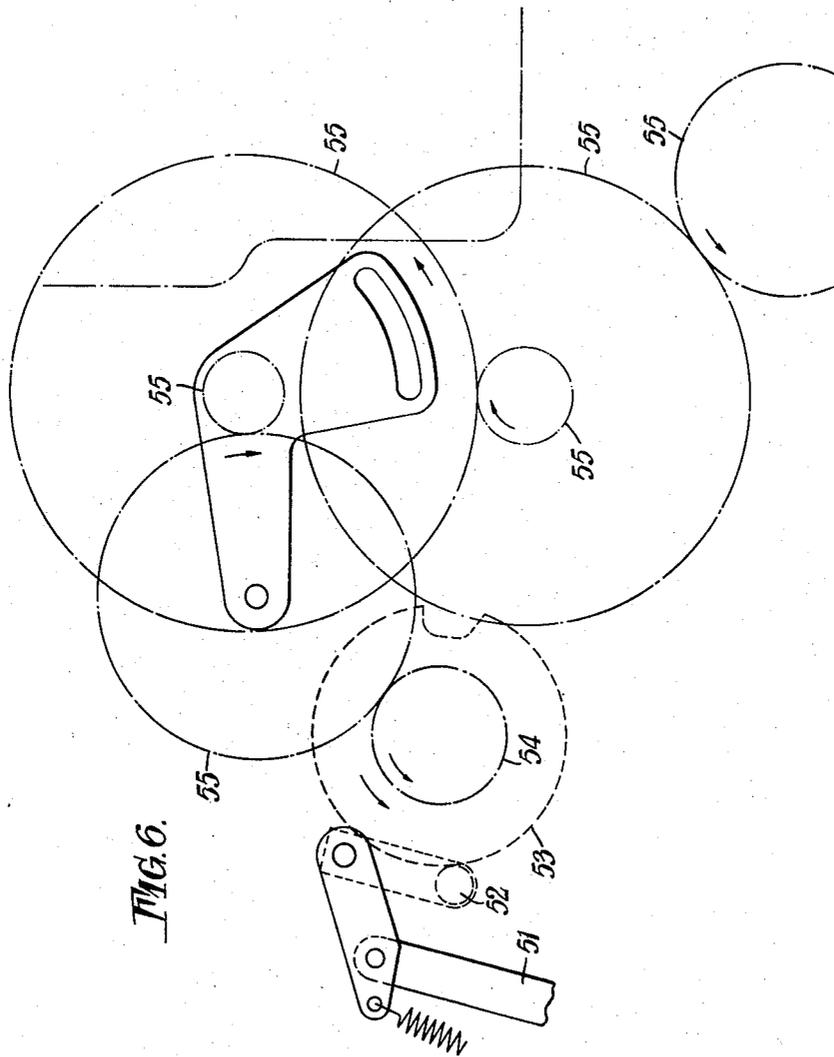


FIG. 6.

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SHEET FEEDING AND STACKING APPARATUS

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6 Sheets-Sheet 6

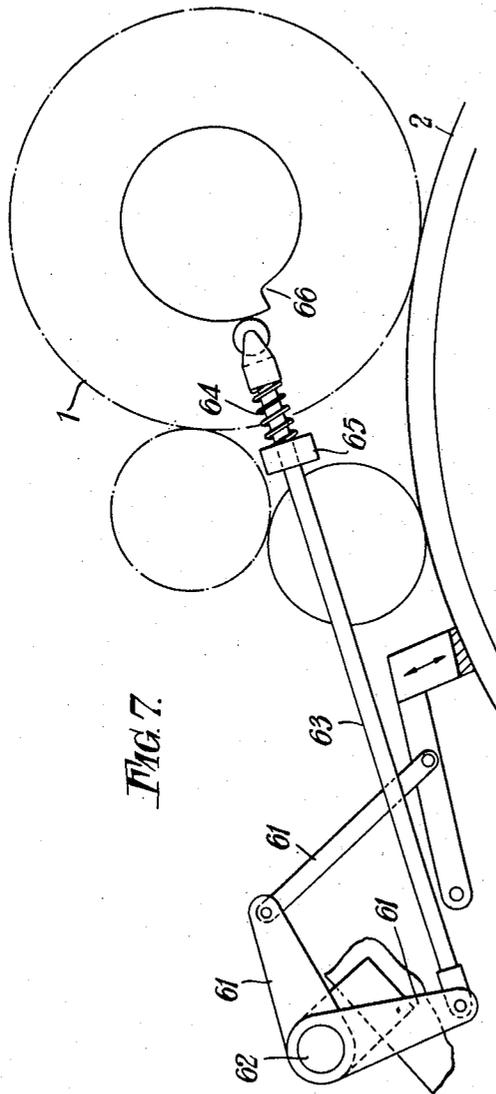


FIG. 7.

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2,872,190

SHEET FEEDING AND STACKING APPARATUS

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Application September 13, 1955, Serial No. 534,109

Claims priority, application Great Britain
September 16, 1954

11 Claims. (Cl. 271-87)

The present invention relates to delivering bags, envelopes, sheets and the like articles from machines.

Although the invention is particularly directed to the delivery from bag and envelope making machines, it is to be understood that the invention is not limited thereto and can be applied to other machines.

The term "bag" used hereinafter in the description and claims is intended to include all the articles mentioned above.

Further the invention is eminently suited for use with machinery for making bags from paper, transparent or translucent viscose, regenerated cellulose or like sheet materials.

Due to the high speed of delivery of bags from bag making machinery, the velocity of a bag when released and freed from a machine is so great that when it comes into contact with a base plate or stop, the momentum (mv) of the bag is such that there is considerable danger of the bag sagging or creasing. This, it will be readily understood, becomes more acute when a heavier bag is being dealt with, since the mass is increased.

It has been found in practice that this danger is very pronounced with an edge downward delivery to a base plate and from this to a delivery table or belt, with which is associated a bag support.

It will be obvious that when the bags sag or crease on delivery, a uniform register or alignment of the successive bags of the pile or stack of delivered bags cannot be obtained with the result that a smooth running and output of the machine are seriously affected.

The bags or the like as they are delivered should have such a momentum that the danger referred to above is avoided and the articles are delivered so that a good register or alignment is obtained and the successive sheets delivered laid in the same relative positions one upon the other as these reach the bag support.

Under one feature of the present invention positive means are provided which become effective at a predetermined time and place during the delivery of a bag, whereby a braking action is applied to the velocity or speed thereof, that is to say, the velocity or speed is momentarily stopped or retarded or slowed down to such an extent that the momentum of the bag when it contacts a base plate or stop adjacent the delivery table has been diminished so that sagging or creasing is avoided and a good register or alignment of successive bags against the support on the delivery table is obtained, whereby a smooth running of the machine is maintained and a higher output per unit of time obtained.

Under another feature of the invention means are provided whereby a batch of bags already delivered on or against a base plate or stop of a machine are held adjacent the delivery end or bottom folding roll for a predetermined time before being released to a stack or pile against a support on a moving tape delivery, the release from the batch being one bag at a time, that is to say, as a bag is delivered to the batch, the bag of

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the batch remote therefrom is released to the stack or pile.

With such an arrangement an operator may readily remove any bag or bags intermediate of those actually stacked against the support and those held adjacent to the roll.

Further features of the invention include mechanism adapted to serve as counting apparatus and means for driving a tape or belt delivery.

The positive braking comes into operation when the bag is released or freed from the grippers on the delivery or bottom folding roll so that the velocity of the bag is slowed down to such an extent that its momentum when it contacts with the base plate or support is not sufficient to cause sagging or creasing.

The accompanying drawings illustrate examples of the carrying into effect of the invention as applied to a bag making machine.

In the drawings:

Fig. 1 is a side view showing the invention applied to the delivery side of a bag making machine.

Fig. 2 is a diagrammatic plan view showing the position of spring gates and dabbers referred to later.

Figs. 3 and 4 are views showing the delivery spring gates.

Fig. 5 shows the bag support and carriage assembly.

Fig. 6 shows the gearing for the counting device, and Fig. 7 is a view of a variant construction.

It is to be understood that the bag making machine is of known type and therefore is not fully illustrated nor described, the invention residing in the features referred to earlier.

At the delivery end of the machine there is the usual top folding roll 1 and a bottom folding roll 2. The top folding roll deals with one bag per revolution and the bottom folding roll with three bags per revolution. The latter roll has the usual grippers 3 and strippers 4 and the top roll a dipper and paster (not shown) all functioning in known manner. The usual presser roll 5 is provided.

Forward of the top folding roll 1 and presser roll 5 in the direction of rotation of the bottom folding roll are positive means for momentarily stopping or retarding or slowing down the velocity of the bag. These means consist of dabbers 6 which become effective on a bag 7 on the bottom folding roll 2 at a predetermined time.

The dabbers 6, there being two in this construction, are mounted on pivoted frames 8, one frame for each dabber, the pivot points for the frames being indicated by 9.

Each dabber consists of a metal base part 10 on the front of which is screwed a resilient pad 11. The base part 10 is mounted on a runner track 12 carried by the frame 8 so that the dabber can be moved between points X and Y to suit any length of bag being made.

The dabbers contact the tail of a bag on the bottom folding roll when the bag has been freed from the grippers 3 by the strippers 4 in the known way.

The swinging movements of the pivoted frames 8 (which carry the dabbers 6) towards the bottom folding roll 2 to bring the dabbers into operation, is done by means of three equidistant cam segments 13 (one only is shown) attached to the rotating bottom folding roll 2. Each rise 14 of a cam segment 13 in turn contacts a roller 15 on an arm 16 which is pivoted at 17 to a frame 8. When the roller 15 leaves the cam rise 14 the frame is drawn back from the bottom folding roll 2 by a spring 18. A back stop 18a is provided for the dabber frame 8. The spring 18 is secured at one end to the frame of the machine.

It will be appreciated that when a bag is carried round

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by the grippers on the bottom folding roll that the velocity of the bag is the same as the peripheral speed of the roll. Now on the bag being freed the velocity thereof would in the normal way continue to be practically the same, and it is at this point that the dabbers function to momentarily apply a brake to the velocity of the bag. The bag thereafter continues its travel to the base plate or stop 19 at a reduced velocity so that when the bag contacts said base plate or stop the momentum is such that sagging or creasing does not take place.

The bags are eventually delivered against a bag support 20 on a carriage carried by a moving tape or belt delivery 21.

The tapes 21 are operated by a ratchet operated driving roll 22 so that an intermittent drive is given to the tapes 21. The roll 22 is actuated through linkage 23, 24 and 25 by a roller 26 which is controlled by an eccentric ring 27 attached to bottom folding roll 2, the links having pivot points at 28 and 29. A screw adjustment 30 is provided for varying the speed of delivery tapes according to the thickness of paper used and type of bag being made.

The tapes 21 travel along a stationary delivery table 31. The carriage comprises a trolley 32 having the bag support 20 secured thereto. The trolley 32 has rollers 33 which run on the table 31, when the trolley 32 moves along with the delivery tapes 21.

Pivoted at 34 and 35 to the trolley 32 are two members 36 and 37. A spring 38 is interposed between the members. The members 36 and 37 have noses 39 and 40. The member 36 is adapted to be turned about its pivot point 34 by a hand arm 41. The members 36 and 37 have gripping surfaces 42 engaging the tapes 21 to enable the trolley 32 to move along with the said tapes when the latter are operated by the driving roll 22. When the trolley 32 reaches the end of the tapes remote from the bottom folding roller, or at any intermediate point, and it is desired to return the trolley to that end of the tapes adjacent the bottom folding roller, it becomes necessary to lift the gripping surfaces 42 away from the tapes. This is done by actuating the arm 41 and turning the member 36 about its pivot 34 so that the gripping surface on said member will be lifted up out of contact with the tape. During the turning of the member 36, the nose 39 thereof will engage the nose 40 of the member 37 and turn this about its pivot 35 and thereby lift the gripping surface of the member 37 away from the tape. When the gripping surfaces are clear of the tapes the trolley 32 is free to be moved. On release of the hand arm 41 the spring 38 returns the members 36 and 37 to normal positions with the gripping surfaces 42 engaging the tapes.

The means for holding a batch of delivered bags adjacent to the bottom folding roll comprises spring gates or members 43, the one end of which bears against the outer bag of the batch, and so arranged that as a bag is delivered from the roll, the outer bag of the batch, that is to say, the bag remote from the last delivered bag is released to the stock or pile.

The spring gates or members 43 are made in the form of spring steel fingers which are sweated to plates 44 on spindles 45 passing through clamping blocks 46 mounted on upstanding members 47 secured to the frame of the machine. As shown in Fig. 4 the spring fingers may be in three sections 48, 49, 50 adapted to be detached from one another.

The spring gates are adjustable across the bottom folding roll to suit varying widths of bags.

In this construction the spring gates are approximately $\frac{3}{16}$ inch away from the bottom folding roll.

Counting mechanism may be incorporated in the machine. For example it may be desired to divide up the bags in the stack into series of 50 or 100 units, and to do this some visual indication must be given. This can be done by arranging that the particular bag, say num-

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ber 50, when delivered is positioned above the other bags, as is indicated by 7a in Fig. 1.

The mechanism for doing this consists of a counter arm 51 which as shown in Fig. 6 is moved by a cam roller 52 and counter cam 53 which latter is on the same shaft as a count change gear wheel 54 driven by toothed gearing 55 from the bottom folding roll. Now assuming that indication of a series of 50 bags is to be given. The change gear wheel 54 would have 50 teeth. For a series of 100 bags the change gear wheel would have 100 teeth.

The lower end of the counter arm is attached to a lever arm 56 having its pivot point at 57. The other end of the arm 56 is attached to the lower end of a rod 58, the upper end of which is attached to the arm 16. When the counter arm 51 is moved by the counter cam 53 the arm 16 is raised so that the roller 15 on said arm will be engaged by the appropriate cam segment rise 14 earlier than the in the normal way whereby the dabbers will apply the braking action to a bag at a point ahead of the normal point of application. At the same time an arm 59 will move the strippers upwardly so that the bag is freed earlier. In this way the selected bag will be delivered so as to come to position above the other bags as indicated at 7a in Fig. 1.

When the cam action on the counter arm ceases this returns to normal position under the influence of a spring 60, and the arm 16 and strippers also return to normal positions.

Fig. 7 shows another way of actuating the dabbers by a linkage and lever movement 61, fulcrumed at 62 on the machine frame. This linkage and lever movement 61 is actuated by a rod 63 under spring bias 64 to return to normal position, the rod 63 passing through a fixed bracket 65. The back and forth movements of said rod is controlled by a cam 66, mounted on the axis of the top folding roll 1 and rotating therewith.

It will be apparent that the invention can be variously modified and changed within the scope of the appendant claims.

I claim:

1. In a machine for delivering bags, envelopes, sheets and like articles having a delivery end, a driven roll at said delivery end for delivering the articles, stripper means adjacent to said roll for separating the articles therefrom, and a base plate located in the path of articles separated from the roll by said stripper means against which the articles normally abut, the combination of means located adjacent to said base plate for holding a batch containing a fixed number of articles delivered by said roll in the proximity of the latter and operating in such manner as to release from the batch an article distant from said roll when an article is delivered to the batch by said roll, said last named means comprising at least two resilient members acting against the transverse edges of articles delivered by said roll.

2. The structure according to claim 1, wherein said means for holding a batch of articles is adjustable in the transverse direction of the periphery of said roll for accommodating articles of different widths.

3. The structure according to claim 1, wherein each of said resilient members is a composite member consisting of resilient sections.

4. The structure according to claim 1, further comprising a plurality of dabbers, a pivoting frame mounting said dabbers, cam means associated with said roll, a linkage operatively connected with said frame and actuable by said cam means for moving said dabbers toward and away from the trailing end of and for at least retarding an article while the latter is being delivered by said roll, and means for intermittently varying the position of said linkage and of said stripper means in such manner that said dabbers engage and arrest, and said strippers separate, a selected article before the latter reaches said base plate.

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5. The structure according to claim 4, wherein each of said dabbers consists of a rigid base and a resilient pad connected to said base, and said base is adjustably connected to said pivoting frame.

6. The structure according to claim 1, wherein said machine further comprises a second roll engaging with said first named roll, a plurality of dabbers, a pivoting frame mounting said dabbers, cam means associated with said second roll, and a linkage operatively connected with said frame and actuatable by said cam means for moving said dabbers into and away from engagement with the trailing ends of, and for at least retarding, the articles delivered by said first named roll before the articles reach said base plate.

7. The structure according to claim 1, further comprising a support adjacent to and movable with respect to said means for holding a batch of articles against which support the articles released by said last named means are stacked, trolley means mounting said support, and conveyor means for moving said trolley means.

8. The structure according to claim 7, further comprising means for disconnecting said trolley means from said conveyor means.

9. The structure according to claim 8, wherein said trolley means comprises gripping means normally en-

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gaging and moving with said conveyor means, and said means for disconnecting said trolley means from said conveyor means comprises lever means for moving said gripping means away from said conveyor means.

10. The structure according to claim 7, wherein said conveyor means comprises a ratchet-operated driving roll, a linkage operatively connected with said driving roll, and an eccentric ring on said first named roll for moving said linkage and for driving said last named roll.

11. The structure according to claim 10, further comprising means for varying the speed of said driving roll.

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