Nov. 10, 1931. G. SAGUE 1,830,889

ENVELOPE FILLING MACHINE

Filed Feb. 26, 1926 5 Sheets-Sheet 1

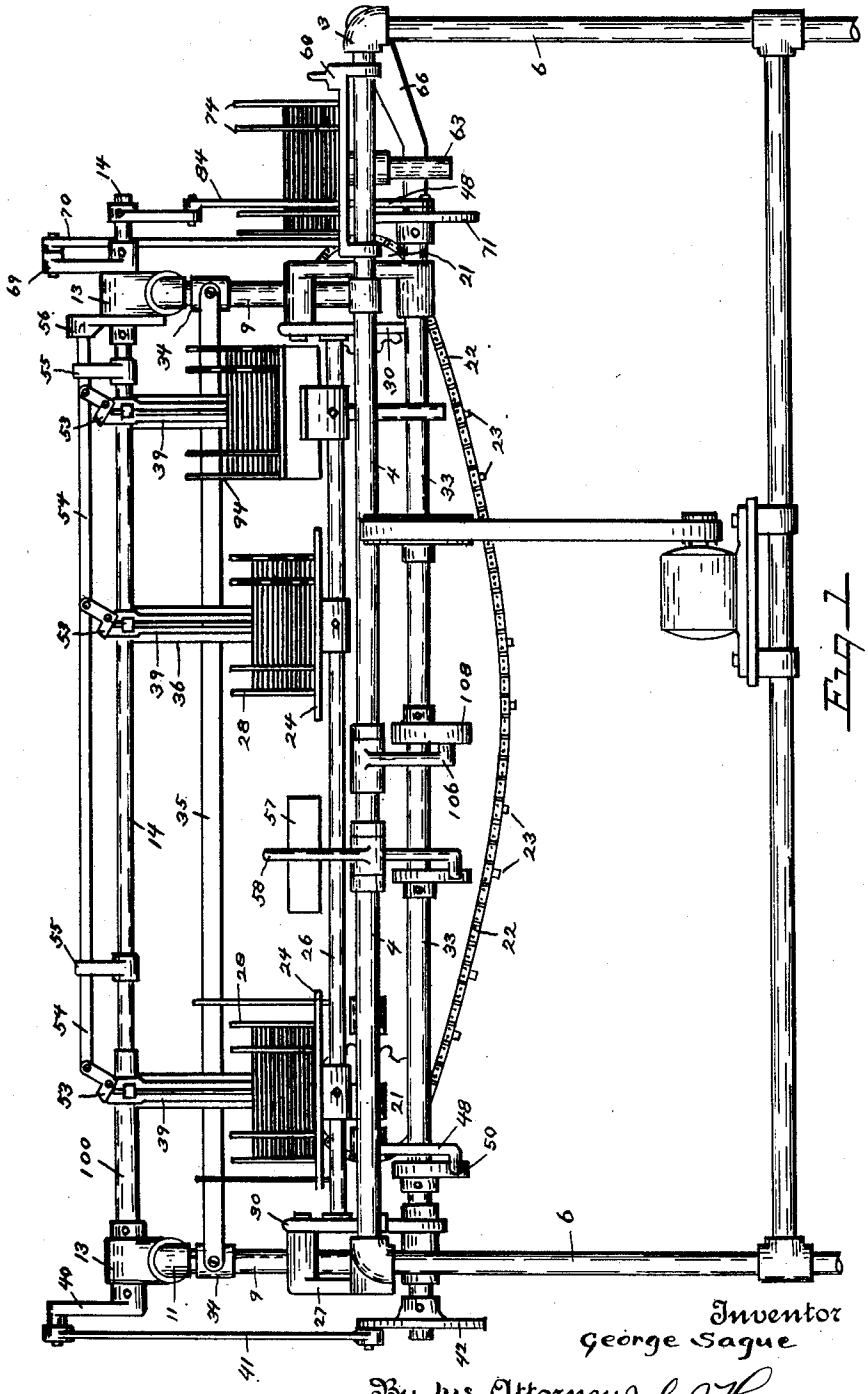


Fig. 1

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ENVELOPE FILLING MACHINE

Filed Feb. 26, 1926 5 Sheets-Sheet 2

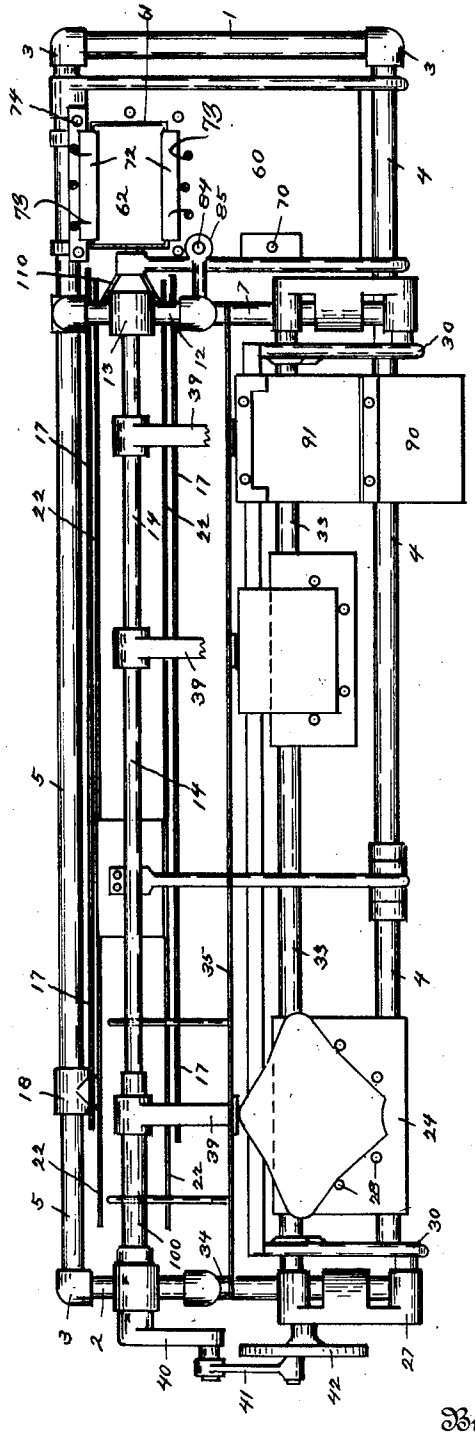


Fig 2

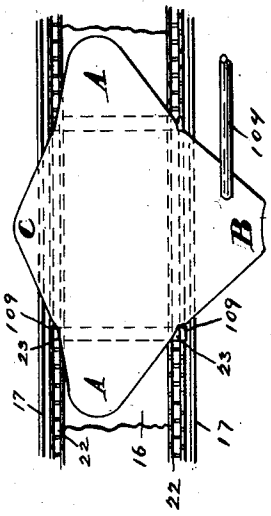


Fig 4

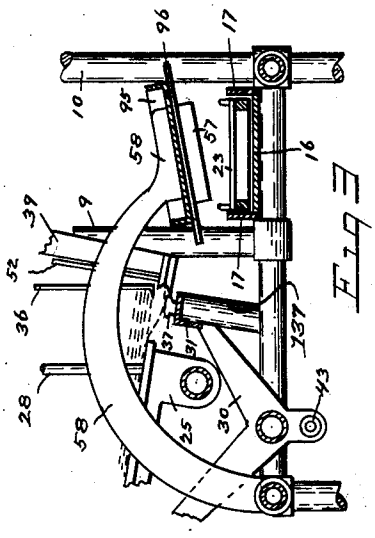


Fig 3

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ENVELOPE FILLING MACHINE

Filed Feb. 26, 1926 5 Sheets-Sheet 3

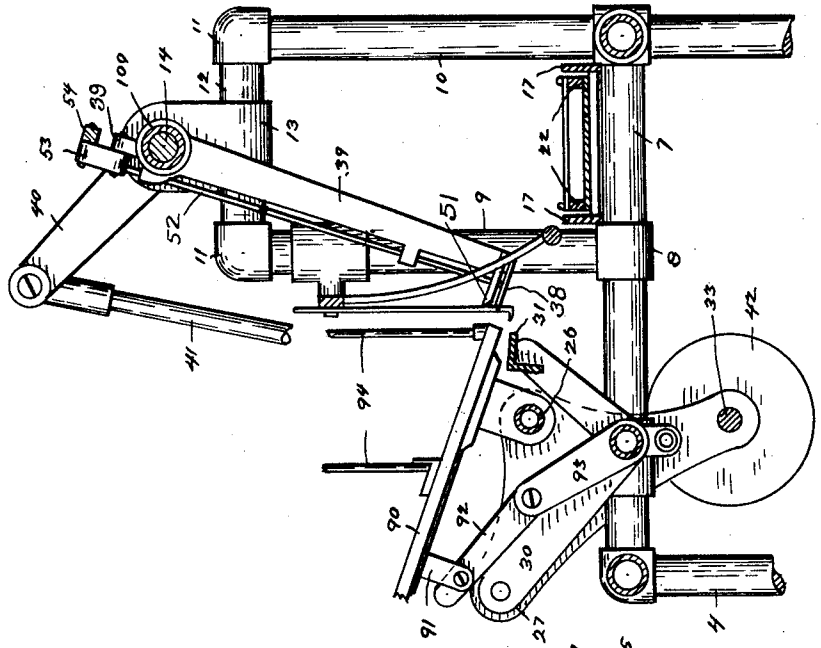


Fig 6

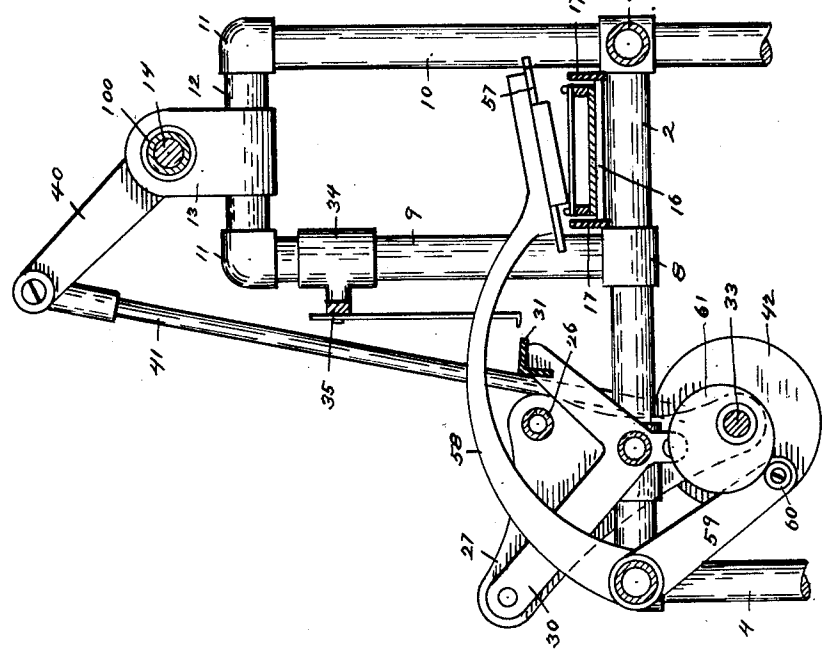


Fig 5

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Filed Feb. 26, 1926 5 Sheets-Sheet 4

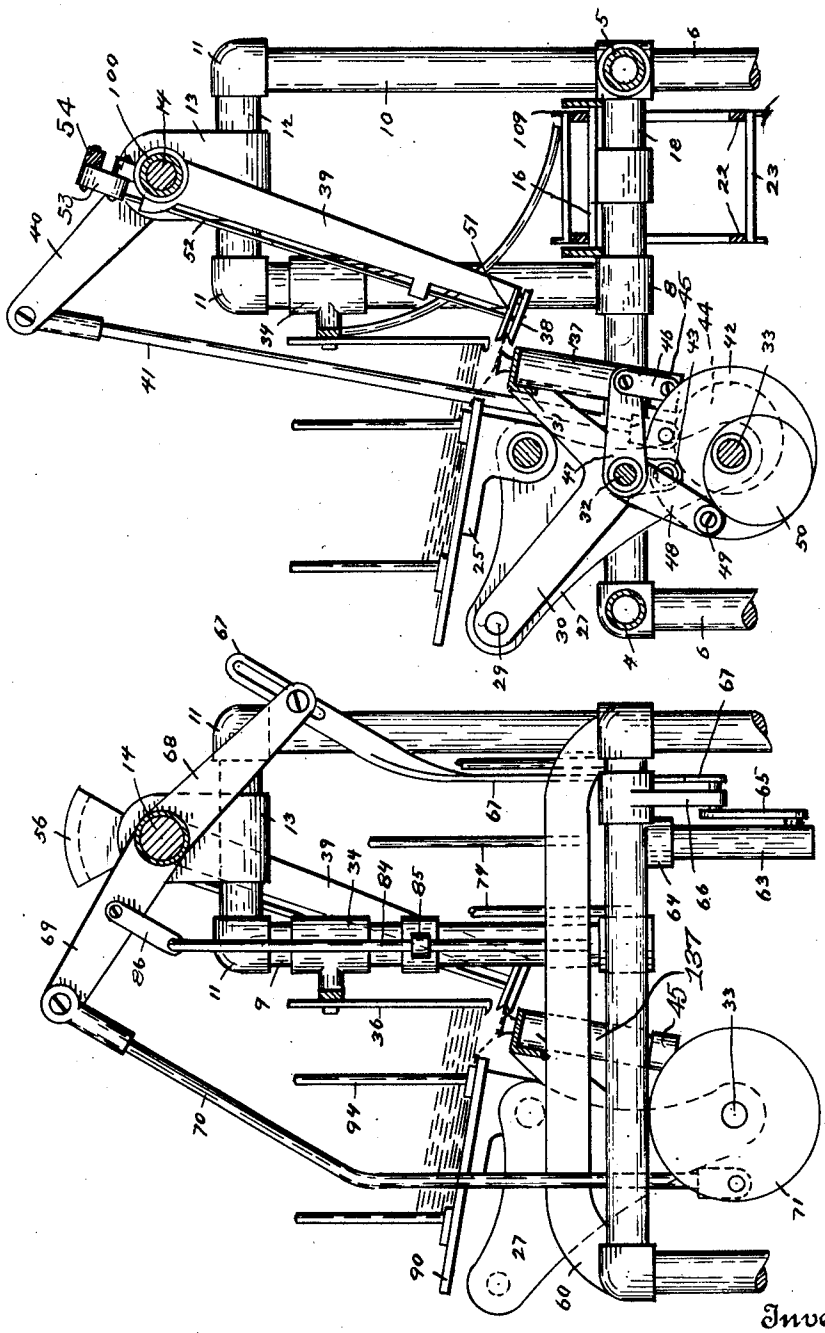


Fig 8

Fig 7

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ENVELOPE FILLING MACHINE

Filed Feb. 26, 1926 5 Sheets-Sheet 5

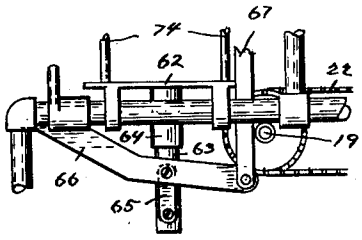


Fig 9

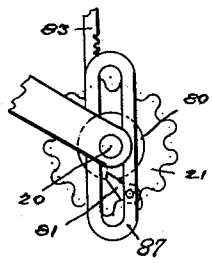


Fig 10

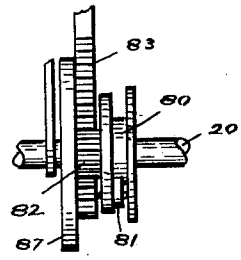


Fig 11

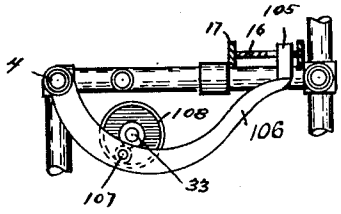


Fig 12

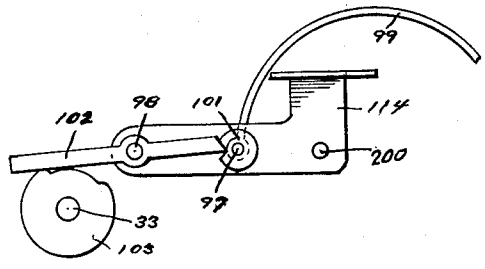


Fig 13

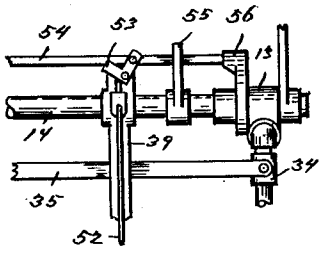


Fig 15

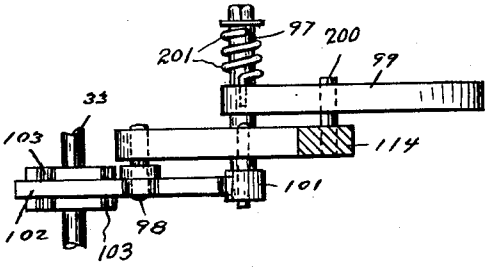


Fig 14.

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Patented Nov. 10, 1931 1,830,889

UNITED STATES PATENT OFFICE

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ENVELOPE FILLING MACHINE

Application filed February 26, 1926. Serial No. 90,920.

This invention relates to a machine for placing letters, cards, or other matter in envelopes, and more particularly to the placing of several articles in one envelope, such as advertising matter and samples.

While machines have been devised for this purpose, they all employ a stock or made up envelope which limits the use of the machine to letters, single sheets, and cards, while by the use of my machine, samples or other articles of irregular size and shape can be placed therein, as I employ a semifinished envelope, which has been cut to form an envelope and ready gummed, but which has not been folded or made up, and by the novel construction and operation of my machine it is folded or closed around the articles to be mailed as that they may be of any thickness or shape, within the limits of the envelope employed.

The object of the invention is to provide a machine that shall be simple of operation, durable, efficient, and of the required speed and automatic in its action.

Another object being to construct a machine of this class that shall be capable of placing as many articles in the envelope as the same will hold and of any size and shape within the capacity of the same.

Still another object being to provide in a machine of this kind means whereby the envelopes after being made up or folded about the contents can either be sealed for first class mail, or "tucked" in for second class; means being provided for moistening the gum and to fold down the flaps in any order to seal or to tuck in.

With these and other objects in view, my invention consists in certain construction and combination of parts as will hereinafter be fully described and claimed and illustrated in the accompanying drawings which form a part thereof and in which like figures of reference refer to corresponding parts in all of the views, but it is understood that while I have described my invention as herewith shown that I do not confine myself to the exact design as shown as slight changes may be made without departing from the spirit of the invention.

For the purpose of simplifying the drawings, in the several views some of the non-essential parts relating to that view are omitted.

In the drawings:—

Figure 1 is a front elevation of the machine.

Figure 2 shows a top plan view from which the transfer arms are only partially shown.

Figure 3 shows a detail of the moistener.

Figure 4 shows a detail of the envelope blank when placed on the conveyor.

Figure 5 is a detail view partly in section of the means employed for "breaking" or forming the envelope blank into an envelope with the flaps partly open.

Figure 6 is a detail view partly in section of the means employed for transferring from the stations the articles to the conveyor.

Figure 7 is an enlarged view of one end of the machine, showing the stacking means.

Figure 8 is a detail view partly in section of the means for holding the supply of envelope blanks and transferring the same, one at a time to the conveyor.

Figure 9 is a detail side view of the stacker and operating means.

Figure 10 and Figure 11 show in detail, means for operating the conveyor in a step by step or intermittent movement.

Figure 12 is a detail of the means employed to register the conveyor with the several stations, so that the envelope and the contents will go in their proper places.

Figure 13 and also Figure 14 are details of the means for folding one of the flaps of the envelope down on the contents.

Figure 15 is a partial view of the means employed for operating the gripper and transferring means.

Referring to the drawings:—

The machine is provided with a series of stations, the first of which contains the stack of envelope blanks, and the succeeding ones contain the articles to be placed in the envelope of enclosure; and passing in front of said stations is a conveyor which is arranged to stop opposite each of said stations and to receive therefrom, first the envelope blank which is then formed into a container by

folding up three of its flaps to receive the contents which is transferred one at a time from each of the other stations as the conveyor stops at each in turn, and after the last station is passed, means are provided for turning down the flaps on the contents and sealing the same, and any other operation which may be desired such as stamping, addressing, etc.

The machine as herewith shown comprises a tubular frame of suitable design, made up of the ends 1 and 2 secured together by the fittings 3 and to the sides 4 and 5 and to the legs 6; and provided with one or more transverse braces 7.

To the brace 7 and the end 2 are secured by the fittings 8 the uprights 9 and 10, the upper ends of which are secured by the fittings 11, the cross pieces 12 which hold the bearings 13, within which are movably mounted the shafts 14 and 100 which are tubular and telescope, and on which are secured in a rigid manner the transfer arms 39 (hereinafter described) which are employed to transfer the envelope blank and the articles to be enclosed from their several stations to the conveyor.

On the brace 7 between the uprights 9 and 10 is secured one end of a track, composed of a bottom 16 and sides 17, which are spaced apart, either the width or the length of the envelope when the same is folded depending on which way the envelope is run through the machine, and the other end of said track 16 is supported on a short brace 18 which is secured to the frame 5.

Adjacent to and below the ends of said track 16 are mounted two short shafts 19 and 20 on which are mounted the sprockets 21, which carry two endless chains 22 in such a manner that said chains travel upon the surface of the track 16; while at suitable spacings said chains 22 are secured together by transverse bars 23, the spacing of which will hereinafter be more fully described.

Starting near one end of the machine the several stations (one being required for the envelope blank and one each for the articles to be placed in the envelopes) are placed in a parallel position to the conveyor which carries the envelope through the machine.

These are first the envelope blank supply station which comprises a plate 24 secured on a bracket 25 which is mounted on a rod or tube 26 which has its ends fastened to the brackets 27 which are mounted on the cross brace 7 and the end 2 of the frame; said plate 24 being provided with posts or piling guides 28 for holding the envelope blanks in a stack.

Referring to Figures 1, 5 and 8, to the brackets 27 are pivoted at 29 the two swinging arms 30; said arms 30 being secured together by a rod 31 and a shaft 32; while near the lower end of said bearing brackets 27 is rotatably mounted a drive shaft 33; which is driven by any suitable power.

Near the upper ends of the uprights are secured the fittings 34 which are joined together by a rod 35 upon which and adjacent to each station is secured a piling guide 36 against which rests the forward edge of the stack.

Referring to Figures 3 and 8, at a point between the edge of the plate 24 and the lower end of the piling guide 36 and on a slightly lower level than the surface of the plate 24 is secured to the rod 31 a suction member 37 employed for the purpose of depressing or pulling down the edge of the lower envelope or sheet from the stack so that it may be readily engaged by the jaw 38 of the transferring arm 39 which arms are secured on the tubular shafts 14 and 100, and are rocked or oscillated by a crank 40 and connecting rod 41 pivoted to a disk 42 secured on the drive shaft 33 in the case of the shaft 14; and in the case of the shaft 100 by the crank 69, rod 70 and disk 71; see Figures 1, 5 and 8.

Referring to Figure 8 for raising the suction members 37 into operating contact with the lower sheet of the stack, the lower ends of the swinging arms 30 are provided with rollers 43 which are in contact with a pair of cams 44 secured to and rotated by the drive shaft 33, in such a manner that after the suction member 37 is raised into operating position, the same may be operated by moving the plunger 45 by means of the links 46 pivoted thereto and the arms 47 which are rigidly attached to the shaft 32 and operated by a lever 48 also rigidly secured to said shaft 32 and having a roller 49 in contact with and raised and lowered by a cam 50 secured on the drive shaft 33, (see Fig. 8) by the action of cam 50 on roller 49.

It will thus be seen that the suction member comprises a cylinder 137 attached to the rod 31 adjacent to the stack of envelopes or inserts, and that said cylinder 137 is raised by the action of the arms 30 by the action of the cam 44 on the arm 30; the upper end of said cylinder 137 is shouldered in the rod 31 and is provided with a suction member for making contact with the lower sheet of the stack when in a raised position, and suction is applied by a plunger 45 which is actuated by the links 46 secured to an arm 47 on the rocker shaft 32, so that when the suction member is raised into contact with the sheet, suction will be applied to hold the sheet, then the cylinder 137 will be lowered thus bringing down with it the sheet to be gripped by the jaw 38 and at the same time the suction will be released.

The plunger 45 is returned to its normal position by the action of a coil spring (not shown) surrounding the stem of said plunger and within the casing 137.

Referring to Figures 1, 8, 6 and 15, for

operating the jaws 38 of the transfer arms 39, the same are formed with a stationary jaw 51 secured to the arm 39 and a movable jaw 38 mounted on the end of a rod 52 which is slidably mounted on said arm 39 and operated by a crank 53 pivoted to the upper end of the arm 39 and moved by a rod 54 to which they are pivoted and which is mounted in the guides 55 secured to the shafts 14 and 100 (see Fig. 1); and which has imparted thereto a longitudinal movement by having its end slide against the face of a cam member 56 secured to the bearing 13, in such a manner that as the shafts 14 and 100 are oscillated the transfer arms 39 will be brought into gripping relation with the envelope or sheet to be transferred; the jaws closed on the same by the action of said cam and remain closed while the transfer arm pulls the sheet from the bottom of the stack and places the same on the conveyor, when the jaw 38 will be opened to release the same.

The conveyor comprises the two endless chains 22 mounted on the sprockets 21 and having a series of transverse cross bars 23 secured thereto, and so spaced as to bring a pair of them opposite each of the stations at the same time as said conveyor is moved in an intermittent manner; and the spacing of each pair of bars 23 being equal to the length of an envelope when the same is folded, so that when in registry with the envelope blank suppply station, each pair of bars 23 taken in connection with the sides 17 of the track will form a die, which when the conveyor is next moved to register with the breaker plate; said breaker plate will descend into said die and upon the envelope blank already placed thereon and will fold upward three of its flaps to form a container; the fourth flap or that one nearest the stations, not being folded, but left flat so that the articles may be freely entered; and for the purpose of keeping the flap out of the way, there is provided adjacent to the track a guide bar 104 under which the flap travels.

For the purpose of registering the bars 23 with the station there is provided (see Figure 12) a stop 105 formed on the end of an arm 106 which is pivoted to the frame 4 and adapted to be operated by a roller 107 running in a race cam 108 secured on the drive shaft 33; said stop extending upward through an opening provided in the track 16 to form a stop for the bars 23 as said conveyor comes to rest at the station, and being then receded out of the path of said bars 23.

For registering the envelope blank upon the conveyor, there are provided the posts or pins 109 extending upward from the ends of the bars 23, in such a manner as to register with the corners of the envelope blank as shown in Figure 4.

After the envelope blank is placed on the conveyor, it is then given a forward movement by the conveyor to the next station, which is the breaker used to form the envelope or fold up the three flaps.

Referring to Figure 5 the breaker comprises a plate 57 of the size and shape of the folded envelope, this plate being mounted on an arm 58 which is pivoted on the frame 4 and provided with an arm 59 operated by a roller 60 in contact with a cam 61 on the drive shaft 33, in such a manner that the breaker plate 57 will press the envelope blank into the die which is formed by the sides 17 of the track and a pair of the cross bars 23 secured to the chains 22 thus forming the blank into an envelope having three of its flaps extending upward and one flap straight out or on a plane with the back.

The envelope blank is thus formed by the breaker plate 57 in conjunction with the die formed by sides 17 of the track and a pair of the cross bars 23, into a three sided box having the end flaps A and the top flap C bent upward at right angles to its front or face. The three sided box thus formed is then carried forward by the conveyor chain, filled with the inserts as described, and as the flaps A and C have had the gum thereon moistened by the pad 96, and the flap B which is not gummed, held flat by the rod 104 during the travel of the envelope; the filled envelope now comes to the end of the machine and is carried under the two curved arms 110 which strike the flaps B and C and fold them down; while as the envelope is drawn into the stacker, the stack will strike one of the end flaps A and fold it down, and at the same time the finger 99 shown in Figure 13 will be actuated to fold down the remaining end flap A, and the pressure of the stack on the filled envelope which has thus been inserted into its bottom will press and seal all of the flaps.

When the envelope blanks are placed in the machine in the stack on the plate, they are provided with the top and bottom gummed flaps, placed in the stack with the gum side up; and at the same time that the blank is formed into the envelope, it is desirable to moisten the gum on the flaps, so that after the envelope is closed or folded, that the flaps may be sealed.

For this purpose (referring to Figures 3 and 4) there is provided attached to the breaker plate 57 a pan 95 designed to hold water; and provided with felt pads 96 fed through holes in said pan, and said pads so arranged as to contact with the gummed parts of the envelope as the same is formed up.

The conveyor is now moved forward another step to the first loading station which, if intended for single sheets or folded sheets is of practically the same construction and operation as that employed for the envelope blanks (and as many of these stations may be employed as desired) the articles from

each station being deposited in a successive manner upon each other within the envelope blank as the same is carried step by step past each station; but the last station here shown is of special design for cards, blotters, etc., the conveyor carries the filled envelopes under suitable closing fingers 110 mounted above the track and which fold down the flaps of the same upon the contents, and for folding in the last flap, there is provided between the last station and the stacker, a finger comprising (see Figures 13 and 14) a bracket 114 secured to the frame and having pivoted therein the shafts 97 and 98, the shaft 97 having secured thereon the resilient finger 99 adapted to fold over the flap, and operated by the notched roller 101 which is secured on the other end of the shaft 97 and engaged by one end of a rocker lever 102 mounted on the shaft 98 and actuated by a cam 103 on the drive shaft 33. The action of the finger 99 is limited by a stop pin 200 mounted in the bracket 114; and said finger is held under spring pressure by the coil spring 201 mounted on the shaft 97 with one end secured thereto and the other end secured to the finger 99.

The envelope is then carried under the stacker which is formed as follows; to the side frames 4 and 5 adjacent to the end 1 is secured a table 60 formed with an opening 61 in line with the conveyor and approximately of the same size and shape as the folded envelope.

The opening 61 is fitted with a stacker plate 62 mounted on a plunger 63 (see Figure 9) reciprocating in a bearing member 64 which is secured to the frame; said plunger 63 being actuated by a link 65 pivoted to the same and to the lower end of a lever 66 having one of its ends pivoted to the frame 4 and the other end connected by a lever 67 to a crank 68 attached to the shaft 100, (see Figure 7) said shaft being operated by a crank 69 and connecting rod 70 pivoted to a disk 71 on the drive shaft 33.

It will thus be seen that as the filled envelope is carried forward by the chain, the first flap comes into contact with the curved fingers 110 which fold the flap down on the envelope as the same is carried under them.

As to the folding of the other flap, by referring to Figures 13 and 14 of the drawings, it will be seen that the finger 99 is shown in its lowered or closing position and the end of the same is supposed to be resting on the closed flap of the envelope; and when in an open position it is raised to about a vertical position, and in its action it comes up by the side of the envelope, engages the flap and turns the same over on the envelope, and holds it in this position while the envelope is entering the stack.

Adjacent to the edge of the opening 61 in the table 60 are placed two latches 72 which are hinged to said table and provided with springs 73 to hold them in a closed position, their edges projecting slightly over the plunger plate, so that as a filled and folded envelope is fed by the conveyor onto the stacker plate 62, the plunger 63 will force the same upward through the opening 61 raising the latches 72 which will at once by the action of the springs 73 assume a closed position below the envelope and support the stack allowing the plate 62 to descend to receive the next envelope, and in this manner the filled envelopes are fed into the bottom of the stack which is raised each time and the weight of the envelopes will seal the lower one (the gum having been moistened); suitable guide posts 74 are provided to retain the stack in proper position and when the stack has reached a suitable height, the greater part may be removed by the operator, always leaving sufficient to form a weight for sealing purposes or a suitable weight may be employed as when in starting up the machine.

Referring to Figures 7, 10 and 11, for operating the conveyor chains 22 in an intermittent manner there is provided on the shaft adjacent to one sprocket (this pair of sprockets being freely rotatable on the shaft) a one tooth ratchet 80 rigidly secured to said shaft; and a pawl 81 secured to one of said sprockets and engaging said ratchet 80; while to said ratchet 80 and on said shaft is secured a pinion 82 in mesh with and rotated by a rack 83 which is reciprocated by a rod 84 mounted in a bearing 85 on the upright 9 and connected by a link 86 to the crank 69; a guide yoke 87 being attached to the rack 83 in such a manner that one complete downward stroke of the rack will rotate the sprocket one complete revolution moving the conveyor from one station to the next and the upward stroke of the rack will not rotate the sprocket as the pawl will only click.

Referring to Figures 2 and 6 the special feed for cards, etc., comprises an inclined plate 90 supported on the shaft 26; said plate 90 being formed with a sliding plate or kickout 91 adapted to be reciprocated and to push out the under article from the stack or pile on the plate 90; said ejecting plate 91 being operated by a lever 92 and crank 93 on the shaft, and by the cam provided therefor; while guide posts 94 are provided for the articles and in the case of samples any suitable hopper may be employed to hold the same, and in this case the transfering arm is employed but not the suction device.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is

1. In a machine of the class described and in combination with an endless conveyor and means for imparting an intermittent movement to the same, a series of stations for holding a supply of envelope blanks and articles

to be placed therein, means for first placing an envelope blank on the conveyor, means for bending up three of its flaps, means for placing the articles within said partially formed envelope, means for closing, and means for sealing the same.

2. In a machine of the class described and in combination with a conveyor moving in an intermittent manner through said machine, a series of stations arranged along the travel of said conveyor, one of said stations adapted to hold envelope blanks, and the other stations articles to be placed therein, means for placing one envelope blank at a time on said conveyor, means for folding up three of the flaps of said envelope, means for placing one article from each station in said partially formed envelope, means for closing the flaps thereon, means for sealing and means for stacking the same.

3. In a machine of the class described and in combination with a conveyor, a series of stations arranged along the path of travel of said conveyor, means for stopping said conveyor at each station during its travel through said machine, means for placing first an envelope blank on said conveyor, means for folding three sides of said blank, means for placing articles from the stations therein, and means for stacking the same.

4. In a machine of the class described and in combination with a conveyor and means for imparting an intermittent movement thereto, a series of loading stations arranged adjacent to said conveyor along the path of its travel and adapted to hold envelope blanks and articles to be placed therein, means for transferring a blank to said conveyor, means for folding three of its sides, means for holding its fourth side open, means for placing the articles from said stations therein and means for closing, and means for stacking the same.

5. In a machine of the class described and in combination with a conveyor and means for imparting a stop and start movement thereto, a series of loading stations arranged in the path of the travel of said conveyor, one of said stations adapted to hold envelope blanks having four flaps and provided with gum, of means for moistening said gum, means for partly folding three sides of said blanks, means for placing articles from said loading stations therein and closing and sealing the fourth flap.

6. In a machine of the class described and in combination with a conveyor, a series of stations adjacent thereto, one of said stations adapted to hold envelope blanks having four flaps, two of the same being gummed, means for withdrawing a blank and placing the same on the conveyor, means for moistening the gum thereon, means for folding up three of the flaps, means for placing articles from the stations therein, closing and sealing the fourth flap.

7. In a machine of the class described and in combination with means for conveying articles through said machine, a series of loading stations arranged along the path of travel of said conveying means, means for stopping the conveyor means at each of said stations and registering the same therewith, one of said stations adapted to hold gummed envelope blanks, in the form of a pile thereon and the other stations articles also arranged in piles, means for transferring one of the envelope blanks from the pile to the conveying means, means for partly folding three sides of said blanks, means for transferring one of the articles from each pile to said partially formed envelope on said conveyor, means for closing the flaps thereon, means for sealing, and means for stacking the same.

8. In a machine of the class described, comprising a series of stations adapted to hold a supply of envelope blanks and articles to be placed therein, means for taking an envelope blank, means for folding three sides of said blanks and conveying it from station to station, stopping at each in turn, means for placing an article from each station therein, means for closing the envelope about said articles, means for sealing the same, and means for stacking.

In testimony whereof I hereunto affix my signature.

GEORGE SAGUE.