

Oct. 4, 1932.

G. J. EGENOLF

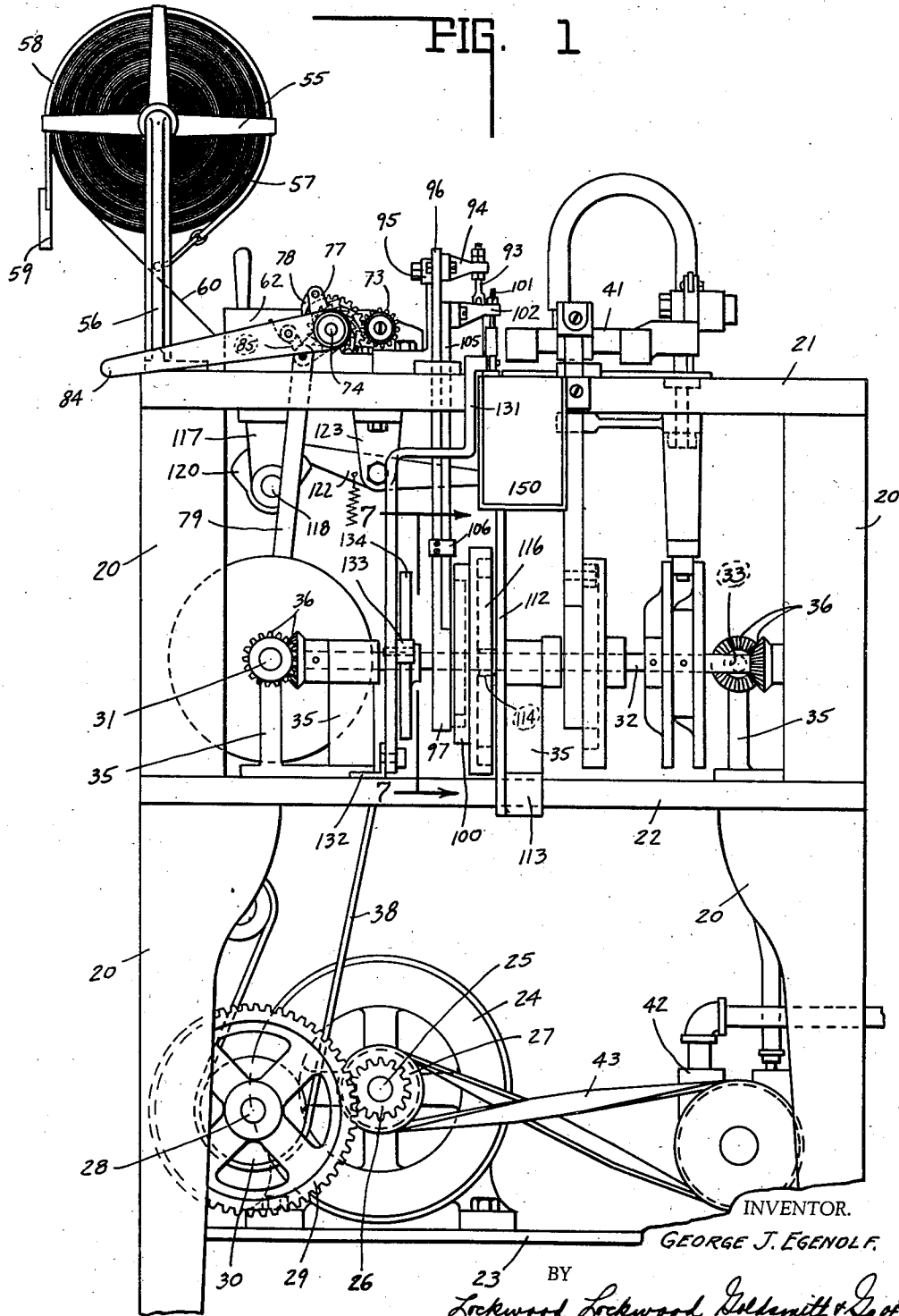
1,880,926

WRAPPING AND SEALING APPARATUS

Filed June 11, 1931

5 Sheets-Sheet 1

FIG. 1



Oct. 4, 1932.

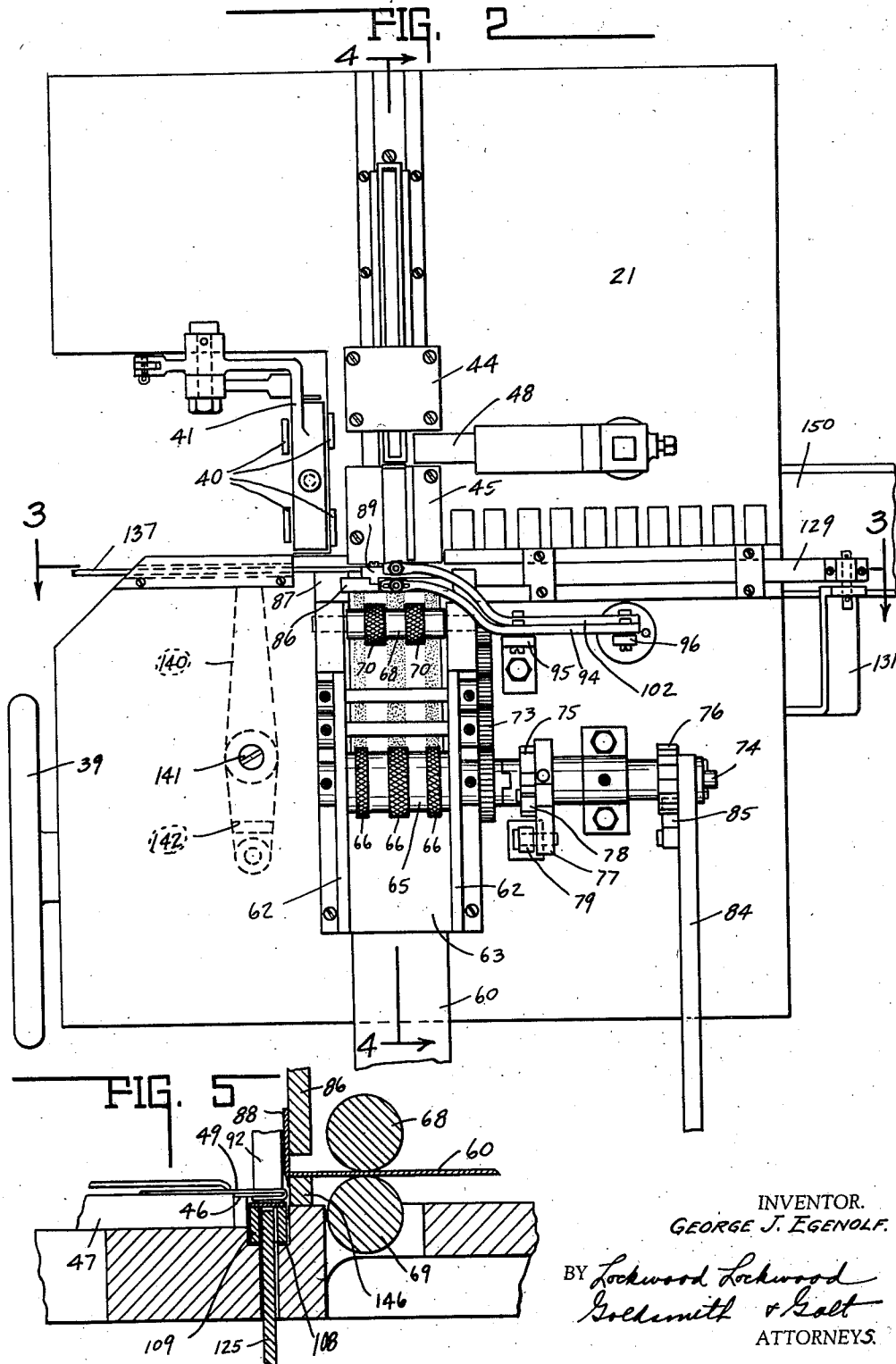
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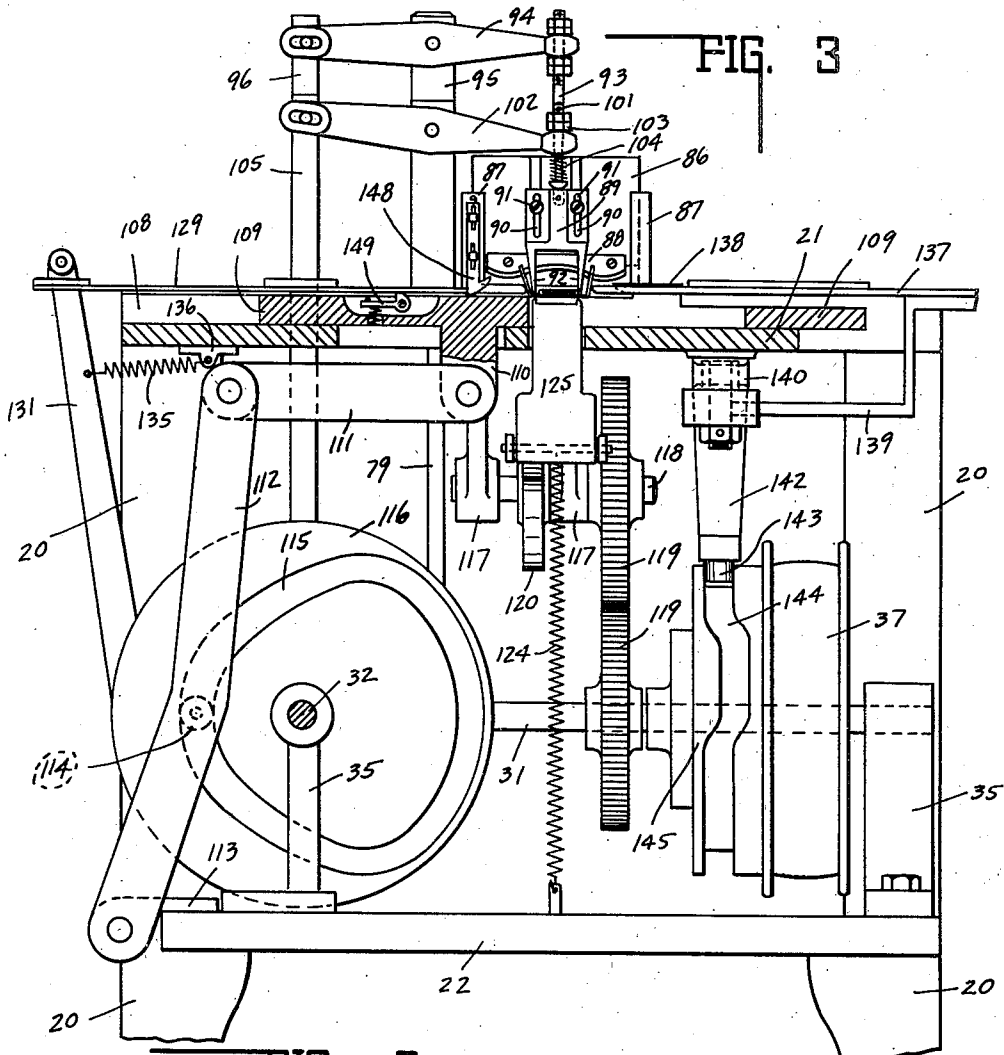
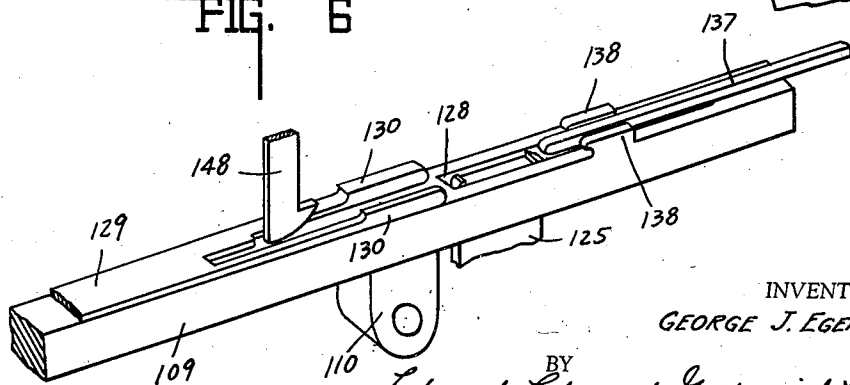


FIG. 6



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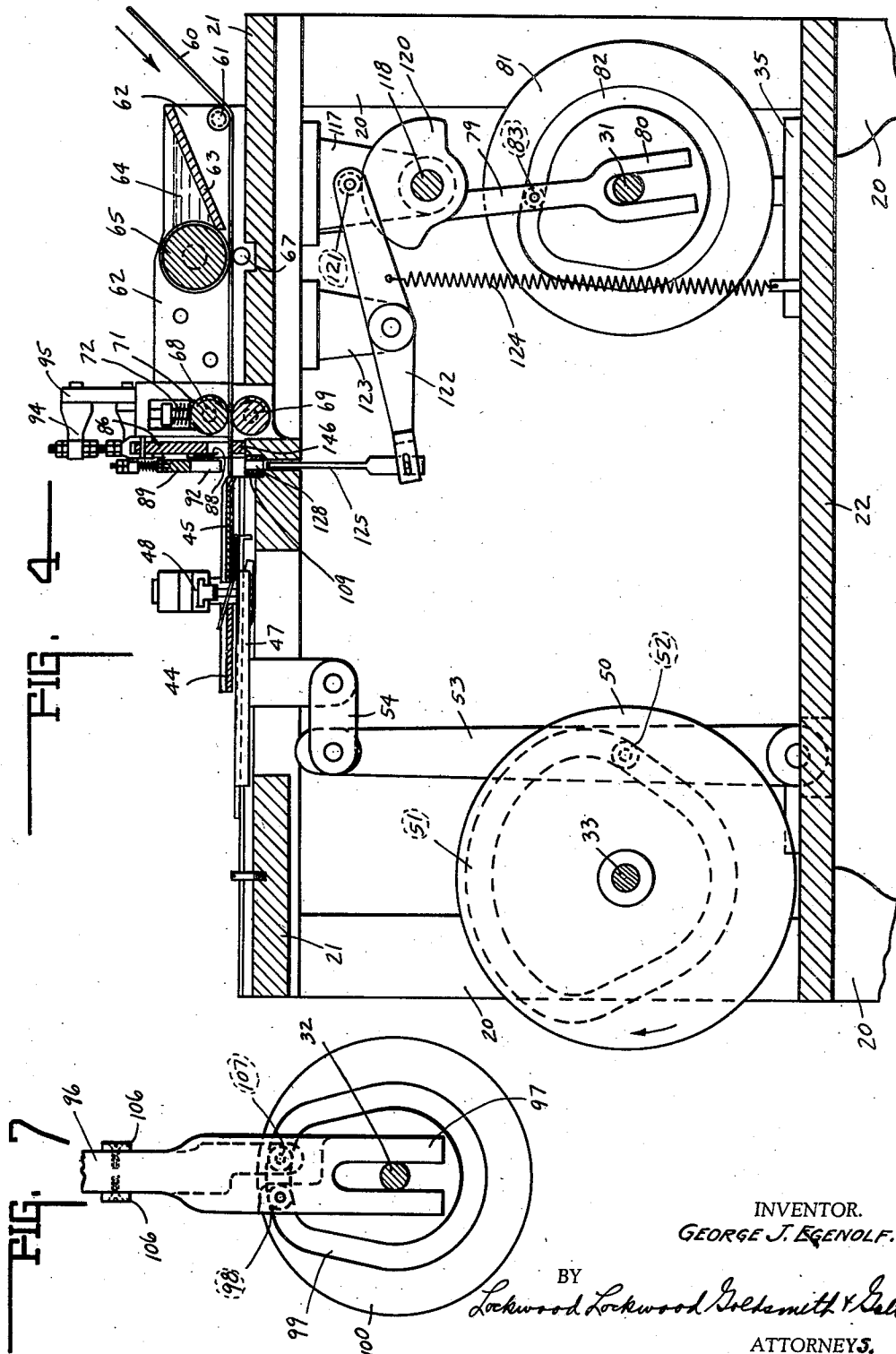
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FIG. 8

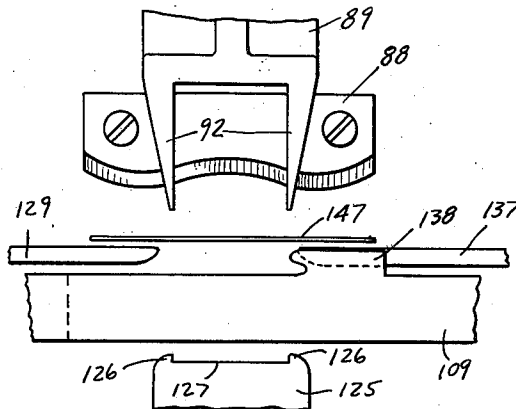


FIG. 9

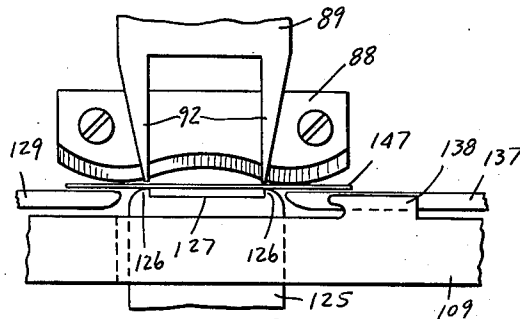


FIG. 10

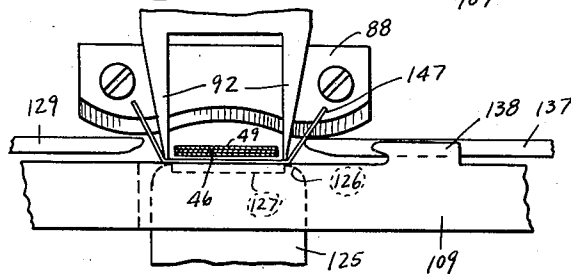
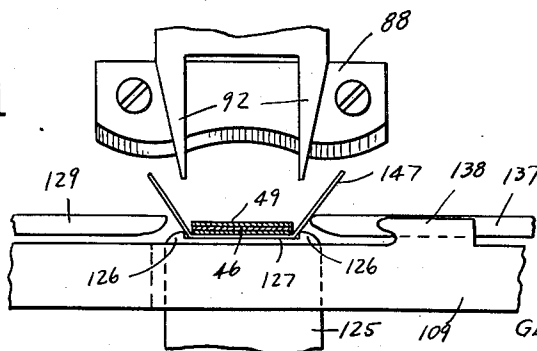


FIG. 11



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UNITED STATES PATENT OFFICE

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WRAPPING AND SEALING APPARATUS

Application filed June 11, 1931. Serial No. 543,539.

This invention relates to a machine for folding articles, such as paper or cloth, and sealing the same in a predetermined manner. More particularly, it relates to the folding and sealing of strips of paper containing printed information which is to be kept secret until the seal is broken and other printed material which is to be exposed.

In the popular parlor game of "Ask me another", pieces of paper are usually prepared having a question of general interest printed on an exposed portion and the answer thereto printed on a folded portion not exposed to view until an answer has been attempted by one of the players of the game.

In my Patent No. 1,787,817, issued January 6, 1931, and in my co-pending application, Serial No. 506,782, filed January 5, 1931, I have disclosed and claimed a machine particularly adapted to fold and seal such pieces of paper. The object of the present invention is to make improvements in the mechanism disclosed in the said patent and co-pending application.

As in the said previous patent and application, the specific object of the apparatus is to fold papers as described above, but it is possible to use the invention for other purposes,—as for example, folding and sealing payroll checks so that the name of the payee is visible and the amount of the check is invisible. The invention may also be used where no visible matter is to be exposed,—as for example, folding and sealing circulars for mailing or folding and sealing handkerchiefs or wash cloths for sale. Accordingly, although the following specification is drawn to a machine for folding and sealing small slips of paper, it is understood that the invention is not limited to the specific form herein disclosed.

The principal feature of the present invention resides in the novel form of apparatus used in the wrapping and sealing of the articles.

Other features of the invention and the full nature thereof will be understood from the accompanying drawings and the following specification and claims:

Figure 1 is a side elevation of a complete folding and sealing machine embodying the

invention. Figure 2 is a top plan view thereof. Figure 3 is a vertical sectional view of the upper portion of the machine taken substantially on the line 3—3 of Figure 2. Figure 4 is a similar sectional view taken substantially on the line 4—4 of Figure 2. Figure 5 is an enlarged sectional view of a portion of Figure 4. Figure 6 is a perspective view of certain of the sealing members in assembled relation. Figure 7 is a sectional view of a particular detail taken on the line 7—7 of Figure 1. Figures 8, 9, 10 and 11 are elevational views of members used in the manipulation of the wrapping material shown in different positions during their cycles of operation.

Referring to the drawings, a plurality of legs 20 support an upper deck member 21, an intermediate deck member 22 and a lower deck member 23. An electric motor 24 is mounted on the lower deck member 23 and carries, on its shaft 25, a pinion 26 and pulley 27. A second shaft 28 carries a spur gear 29 and pulley 30.

Mounted on suitable bearings 35 on the intermediate deck member 22 are three shafts, 31, 32 and 33. Bevel gears 36 constitute a driving connection between the three shafts. A pulley 37 is mounted on the shaft 31 and is driven from the pulley 30 by a belt 38 (shown in Figure 1 but not shown in Figure 3). The shafts 31, 32 and 33 carry a plurality of cams which are used to impart the desired motions to the various parts of the machine, as will be hereinafter described. Each shaft makes one complete revolution for each cycle of operation of the machine and one completely folded and sealed paper is delivered from the machine at each cycle. A hand wheel 39, shown in Figure 2, is carried on the shaft 31 and is used for small movements of the machine in making adjustments.

Four vertical bars 40 constitute a magazine for a pile of papers to be folded. These papers are automatically moved from the magazine by means of a movable suction block 41 connected to a vacuum pump 42 driven by a belt 43 from the pulley 27, all as described in the before-mentioned issued pat-

ent and co-pending application. The papers from the magazine are placed upon receiving plates 44 and 45 by the movement of the said suction block and are folded about a reciprocable tongue 46 (Figure 5) carried on a reciprocable member 47. This is accomplished by folding apparatus indicated generally by the numeral 48 and described in detail in the said patent and co-pending application. Since this apparatus forms no part of the present invention, it will not be herein described in detail. It is sufficient to say that each paper 49, when folded about the tongue 46, is moved into the position shown in Figure 5 by movement of the reciprocable member 47 when actuated by a cam 50 carried by shaft 33. The cam 50 is provided with an irregular guideway 51 engaging a roller 52 carried by a vertical lever 53 connected to the reciprocable member 47 by a link 54.

Wrapping material supply

A reel 55 is carried upon a standard 56 in turn supported upon the upper deck 21 and carries a roll of paper 57 or other material to be used for wrapping and sealing the folded papers. A frictional tension is maintained on the roll of paper on the reel 55 by means of a leather belt 58 and counterweight 59, one end of the said belt being fastened to the standard 56. The free end 60 of the strip of paper from the roll 57 is led beneath a roller 61. The roller 61 is carried by a pair of frame members 62 supported upon the upper deck 21. The said frame members form, with a cross member 63, a reservoir for paste or glue 64. One end of the paste reservoir is closed by a paste roller 65 having raised and knurled portions 66. A roller 67 is located beneath the paste roller and the paper 60 is threaded between the rollers 65 and 67 and thence between another pair of rollers 68 and 69.

Each of the knurled portions 66 on the roller 65 carries a film of paste to the paper. The said knurled portions may be located so that the paste is placed on the paper at any desired position. Herein three strips of paste are used, one in the center and one at each edge of the paper. The roller 68 carries raised portions 70 adapted to contact with the paper in the space between the strips of paste. The said roller is mounted in bearings 71 slidably carried on portions of the frame members 62. An adjustable spring 72 abuts against each of the bearings 71 and serves to maintain the roller 68 in yielding contact with the paper. The rollers 65 and 69 are connected by a train of gears 73 to rotate in opposite directions and with the same peripheral velocity.

The roller 65 is carried on a shaft 74 which also carries a pair of ratchet wheels 75 and 76 fixed thereto. Rotatably mounted on the

said shaft is a bell crank 77 carrying on one of its arms a spring pawl 78 adapted to engage the ratchet wheel 75. The opposite arm of the bell crank 77 is pivotally connected to the upper end of a vertical member 79 which carries at its lower end a yoke 80 (Figure 4) straddling the shaft 31. A cam 81 is mounted on shaft 31 and carries in its face an irregular guideway 82. A roller 83 is mounted on the member 79 and is guided within the said guideway. By this construction, the rotation of shaft 31 causes vertical reciprocation of the member 79 and thereby causes rotation of the rollers 65 and 69 through a given distance for each cycle of the machine. The rotation of the said rollers causes the paper 60 to be drawn from the reel and the size of the ratchet teeth 75 is selected to draw the proper length of paper for each cycle to wrap one of the folded papers. A hand lever 84 is rotatably carried on the shaft 74 and carries a spring pawl 85 adapted to engage the teeth of ratchet wheel 76. By means of this hand lever, the rollers may be manually rotated for threading in the paper or for adjustments.

Cut-off and hold-down mechanism

A knife slide 86 is adapted to move in vertical guideways 87 forming a part of frame members 62. The slide 86 has fastened thereto a knife blade 88. A second slide 89 is formed with slotted openings 90 therein engaging screws 91 which are carried by the slide 86. Thus the slide 89 is free for vertical movement with respect to the slide 86. The slide 89 carries a pair of downwardly-projecting fingers 92 for holding down the severed pieces of wrapping material as hereinafter described. The knife slide 86 is raised and lowered by a stem 93 pivotally connected thereto, the upper end of which is attached to a lever 94 in turn pivotally supported at its midpoint on a standard 95. The opposite end of the said lever is pivotally connected to the upper end of a vertical member 96, the lower end of which terminates in a fork 97 straddling the shaft 32. A roller 98 is mounted upon a portion of the fork 97 and moves in an irregular guideway 99 formed in the face of a cam 100 carried by the shaft 32.

The slide 89 is raised and lowered by means of a stem 101 pivotally fastened thereto. The said stem extends through an opening in one end of a lever 102 which is pivotally fastened at its midpoint to the standard 95. The upper end of said stem is fitted with nuts 103 engaging the upper surface of said lever. A compression spring 104 surrounds said stem beneath said lever and abuts at its upper end against the lower surface of said lever and at its lower end against a suitable spring seat resting on top of the slide 89. Thus the slide 89 is positively raised by move-

ment of the lever while the spring 104 provides a yielding connection between said slide and lever when the slide is forced downwardly. The opposite end of lever 102 is pivotally fastened to a vertical member 105. The said member rests against the vertical member 96 and is maintained in parallel relation with respect thereto by means of guides 106 fastened upon the member 96. The lower end of the member 105 carries a roller 107 travelling in the guideway 99. By means of this apparatus, the knife blade is raised and lowered once for each cycle of the machine. The slide 89 is also raised and lowered with a similar motion which, however, takes place slightly later than the motion of the knife slide, due to the fact that roller 107 follows roller 98 in the guideway 99.

Wrapping and sealing mechanism

The upper deck 21 is formed with a rectangular groove 108 extending completely across. In this groove, a reciprocable member 109 is free to move. The said member has a downwardly-extending portion 110 to which is fastened a link 111, the opposite end of which is fastened to a lever 112. The lower end of the said lever is pivotally mounted upon a bearing 113 carried upon the intermediate deck 22. The said lever carries a roller 114 travelling in an irregular guideway 115 in the face of a cam 116 carried by the shaft 32. By this means, the reciprocable member 109 is moved backwardly and forwardly in the groove 108 once for each cycle of operation of the machine.

A pair of bearing brackets 117 are fastened to the underside of the upper deck 21 and support a shaft 118. The said shaft is driven from shaft 31 by means of a pair of spur gears 119. The said spur gears are of equal size and, therefore, revolve the shaft 118 once for each revolution of shaft 31. The shaft 118 carries a cam 120 upon the periphery of which a roller 121 may travel. The said roller is carried by one end of a yoke lever 122 pivotally mounted upon a bracket 123 in turn carried upon the underside of upper deck 21. A tension spring 124 is fastened at one end to the yoke lever 122 and at its other end to the intermediate deck 22. It thus serves to maintain the roller 121 in yielding engagement with the cam 120. The yoke lever 122 has pivotally attached to its outer end a grip member 125 extending upwardly through an opening in the upper deck 21. The upper end of the said grip member is formed with upraised end portions 126 having a depression 127 therebetween. The reciprocable member 109 is formed with an elongated slot 128 (Figure 6) into which the member 125 may project. By means of this mechanism, the grip member 125 is raised and lowered once for each cycle of operation of the machine.

A wrapping slide 129, hereinafter referred to as the "left hand wrapping slide", is positioned above the left hand portion of the reciprocable member 109, referring to Figure 3. The said slide is formed with a bifurcated end 130 (Figure 6) and the opposite end is connected to the upper end of a lever 131. The lower end of the said lever is pivotally mounted upon a bearing 132 carried by the intermediate deck 22. The said lever carries a roller 133 engaging the periphery of a cam 134 carried upon the shaft 32. A tension spring 135 is connected at one end to the lever 131 and at the other end to a bracket 136 fastened on the undersurface of the upper deck 21. The cam 134 is so formed that the wrapping slide 129 is reciprocated once for each cycle of operation of the machine.

A wrapping slide 137, hereinafter referred to as the "right hand wrapping slide", is positioned above the right hand portion of the reciprocating member 109 and is guided by means of a pair of lugs 138 formed upon said reciprocable member. The outer end of said slide has fastened thereto a Z-bar 139 extending beneath the upper deck 21. The end of said Z-bar is pivotally fastened to one end of a lever 140 which is in turn pivotally fastened by means of a stud 141 to the undersurface of the upper deck 21. The opposite end 142 of said lever projects downwardly and carries a roller 143 engaging an irregular guideway 144 in the periphery of a cam 145 carried upon the shaft 31. The guideway 144 is so formed that the right hand wrapping slide 137 is reciprocated once for each cycle of operation of the machine.

Operation

In the operation of the mechanism, the blade 88 and fingers 92 are in the upraised position shown in Figure 8 when the rollers 65 and 69 are rotated to advance the paper 60 into the position shown in Figure 4. The downward movement of the knife blade 88 is then commenced immediately followed by the downward movement of the fingers 92 and accompanied by an upward movement of the grip member 125. The knife blade 88 cooperates with a knife block 146 to sever a piece of paper 147 from the end of the strip 60 of sufficient size to wrap one of the folded papers. The movement of the members is so timed that the fingers 92 and grip member 125 engage opposite sides of the paper 147 as it is cut from the strip 60. This position of the parts is shown in Figure 9. At this point, the movement of the knife 88 has reached its downward limit but the fingers 92 continue their downward travel. The relative strength of the springs 104 and 124 is so chosen that the continued downward travel of the fingers 92 may force the grip member 125 downwardly against the action of spring 124 until the paper comes to rest upon the upper sur-

face of the reciprocable member 109, as shown in Figure 10. In this movement, it will be seen that the paper is gripped firmly between the fingers 92 and grip member 125 so that it is impossible for the paper to move in an undesired manner. In the movement from the position of Figure 9 to that of Figure 10, it is also seen that the ends of the paper engage the ends of the wrapping slides 129 and 137 and are thereby bent into the position shown in Figure 10.

With the parts in the position of Figure 10, the reciprocable member 47 is moved to the right in Figure 4 until it reaches the position shown in Figure 5. In that position, the tongue 46 has brought the folded paper 49 into position above the wrapping material 147. When this position has been reached, the upward movement of the fingers 92 begins and the grip member 125 is free to move upwardly under the influence of spring 124 into the position shown in Figure 11. In this position, the grip member 125 presses the wrapping material 147 firmly against the underside of the folded paper 49 which is still held in place by the tongue 46. The upraised portions 126 of the grip member 125 are positioned to engage the wrapping material 147 at each side of the folded paper so that the said paper rests upon the depressed portion 127 and will not be moved to right or left in the subsequent sealing operation.

With the parts in the position shown in Figure 11, the right hand wrapping slide 137 is moved to the left and operates to fold one end of the wrapping material about the folded paper. The said slide is then retracted and the left hand wrapping slide 129 is moved to the right to fold the opposite end of the wrapping material about the folded paper. The tongue 46 and the grip member 125 are then withdrawn and the reciprocating member 109 is moved to the left, bringing the lugs 138 into engagement with the folded and sealed papers. In this movement, the paper is pushed by the lugs 138 beneath the left hand wrapping slide 129 to a point beyond a spring-pressed dog 148 which extends downwardly between the forks 130 of the slide 129 (Figures 3 and 6). The said dog prevents the return of the papers when the reciprocable member 109 is again moved to the right. A second spring-pressed dog 149, carried within the member 109, serves a similar purpose. When the last-mentioned movement takes place, the parts have returned to their initial position and the cycle is then repeated. Each folded and sealed paper, as it is moved between the slide 129 and the reciprocable member 109, pushes the preceding paper ahead of it until they are discharged into a container 150 carried at the side of the machine.

The invention claimed is:

1. In a machine of the class described, the

combination of apparatus for supplying a strip of wrapping material, a reciprocable knife blade adapted to cut a piece of material from said strip, a hold-down member adapted to engage one surface of said piece of material, a yielding grip member adapted to engage the other surface thereof, and apparatus for moving the said members in timed relation with the movement of said knife blade to grasp said piece when cut and to move the same into position to receive an article to be wrapped therein.

2. In a machine of the class described, the combination of apparatus for supplying a strip of wrapping material, a reciprocable knife blade adapted to cut a piece of material from said strip, a hold-down member adapted to engage one surface of said piece of material, a receiving member for receiving the cut piece thereon, a yielding grip member movable through an opening in said receiving member and adapted to engage the opposite surface of said piece when cut, and apparatus for moving said hold-down member and said grip member to grasp said piece when cut and to move the same to rest on said receiving member in position to receive an article to be wrapped therein.

3. In a machine of the class described, the combination of apparatus for supplying a strip of wrapping material, a reciprocable knife blade adapted to cut a piece of material from said strip, a hold-down member adapted to engage one surface of said piece of material, a receiving member for receiving the cut piece thereon, a yielding grip member movable through an opening in said receiving member and adapted to engage the opposite surface of said piece when cut, and apparatus for moving said hold-down member and said grip member to grasp said piece when cut and to move the same to rest on said receiving member in position to receive an article to be wrapped therein, said apparatus including a yielding connection for said hold-down member whereby the cut piece is yieldingly held upon said receiving member.

4. In a machine of the class described, the combination of apparatus for supplying a strip of wrapping material, a reciprocable knife blade adapted to cut a piece of material from said strip, a hold-down member adapted to engage one surface of said piece of material, a grip member adapted to engage the other surface thereof, a receiving member for receiving the cut piece thereon, said member having an opening therein through which said grip member may pass, blade-moving apparatus for moving said knife blade to cut said piece from said strip, hold-down moving apparatus operating during the movement of said blade for bringing said hold-down member into engagement with said piece and operating thereafter to press said piece against said receiving member, said

apparatus including a yielding connection whereby the cut piece is yieldingly held upon said receiving member, and grip member moving apparatus operating simultaneously with the movement of said hold-down member to move said grip member through the opening in said receiving member to engage the underside of said piece when cut, said last-mentioned apparatus including a yielding connection of less strength than said first-mentioned yielding connection whereby said grip member yieldingly holds said piece against said hold-down member in its movement to said receiving member.

5. In a machine of the class described, the combination of apparatus for supplying a strip of wrapping material, a reciprocable knife blade adapted to cut a piece of material from said strip, a hold-down member adapted to engage one surface of said piece of material, a yielding grip member adapted to engage the other surface thereof, a receiving member for receiving the cut piece thereon, said member having an opening therein through which said grip member may pass, mechanism for placing an article to be wrapped in position adjacent said piece of wrapping material on said receiving member, blade-moving apparatus for moving said knife blade to cut said piece from said strip, hold-down moving apparatus operating to move said hold-down member to press said cut piece against said receiving member and operating after the placing of said article to withdraw said hold-down member, and grip member moving apparatus operating to move said grip member through the opening in said receiving member to engage the said piece when cut, said last-mentioned apparatus including a yielding connection whereby said grip member yieldingly holds said piece against said hold down member in its movement to said receiving member and yieldingly holds said piece against said article when said hold-down member has been withdrawn.

In witness whereof, I have hereunto affixed my signature.

GEORGE J. EGENOLF.

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