Oct. 13, 1964 W. J. HANSON 3,152,800

METHOD OF HANDLING A COMBINATION LETTER-ENVELOPE

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Fig. 1

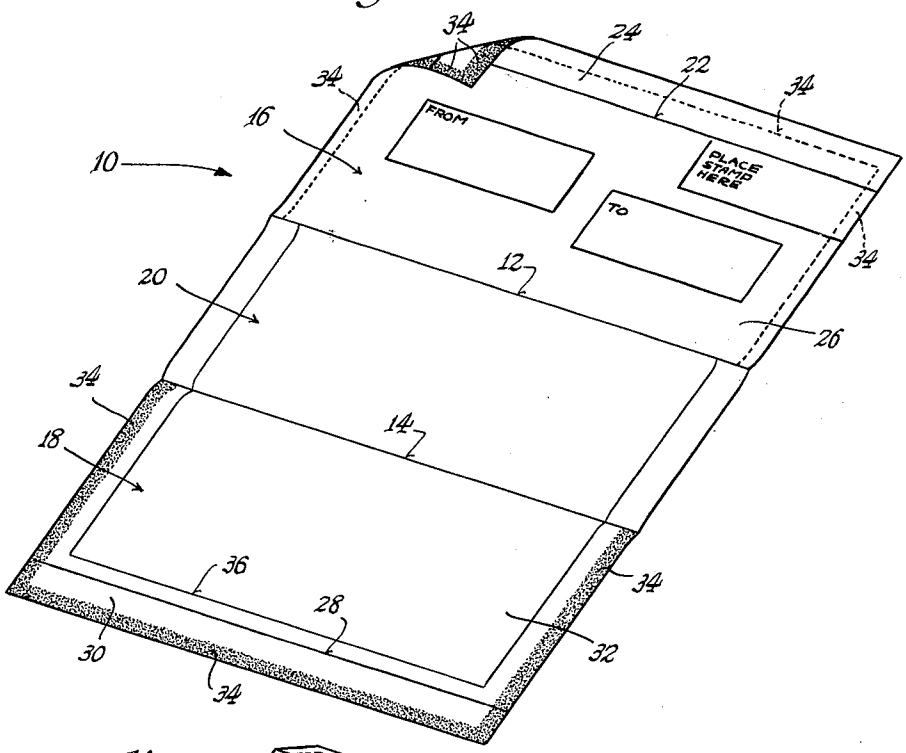


Fig. 2

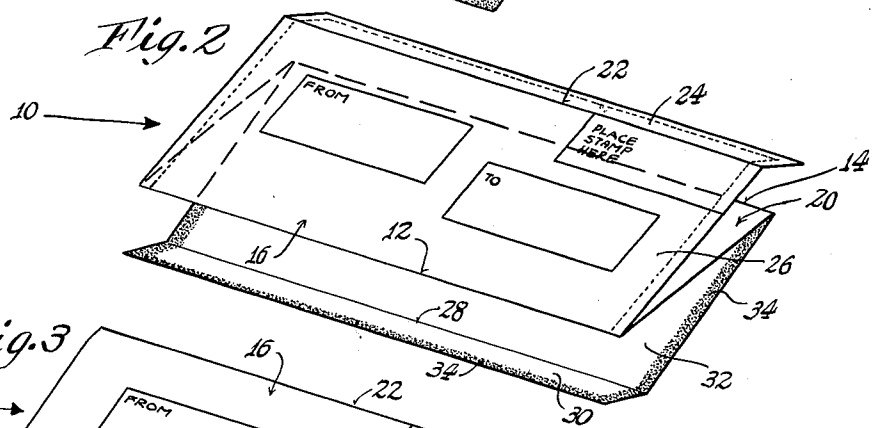
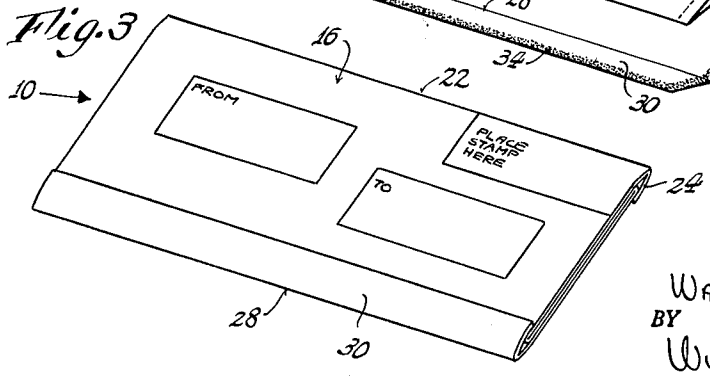


Fig. 3



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Fig. 4

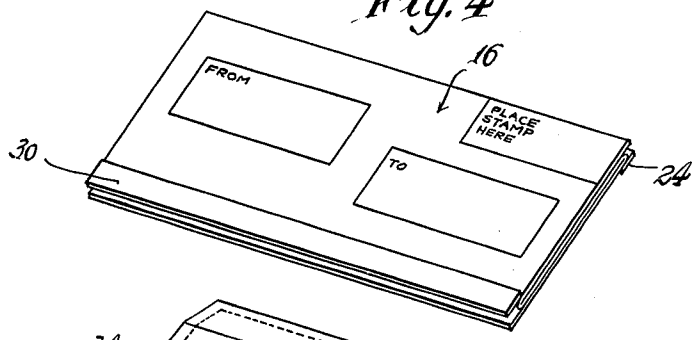


Fig. 5

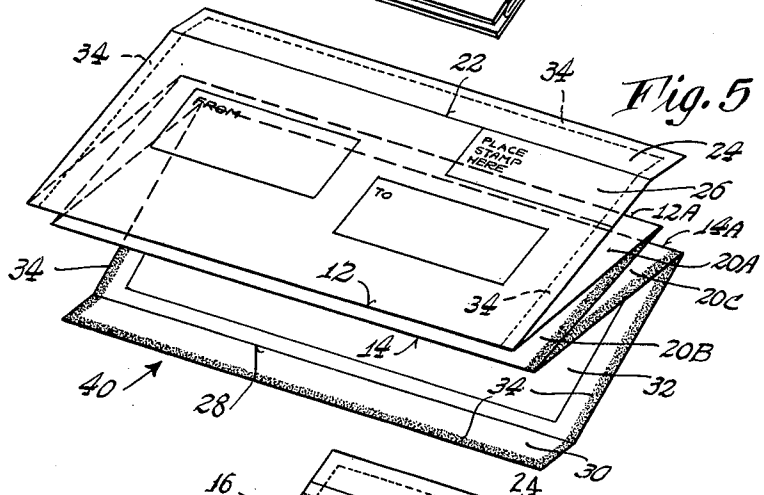
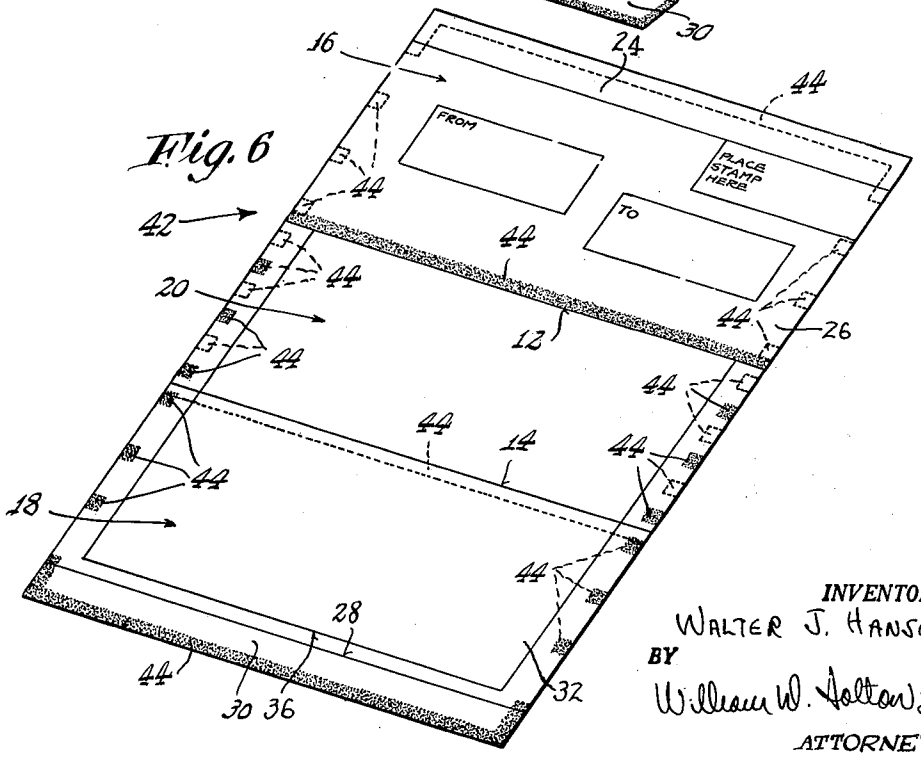


Fig. 6



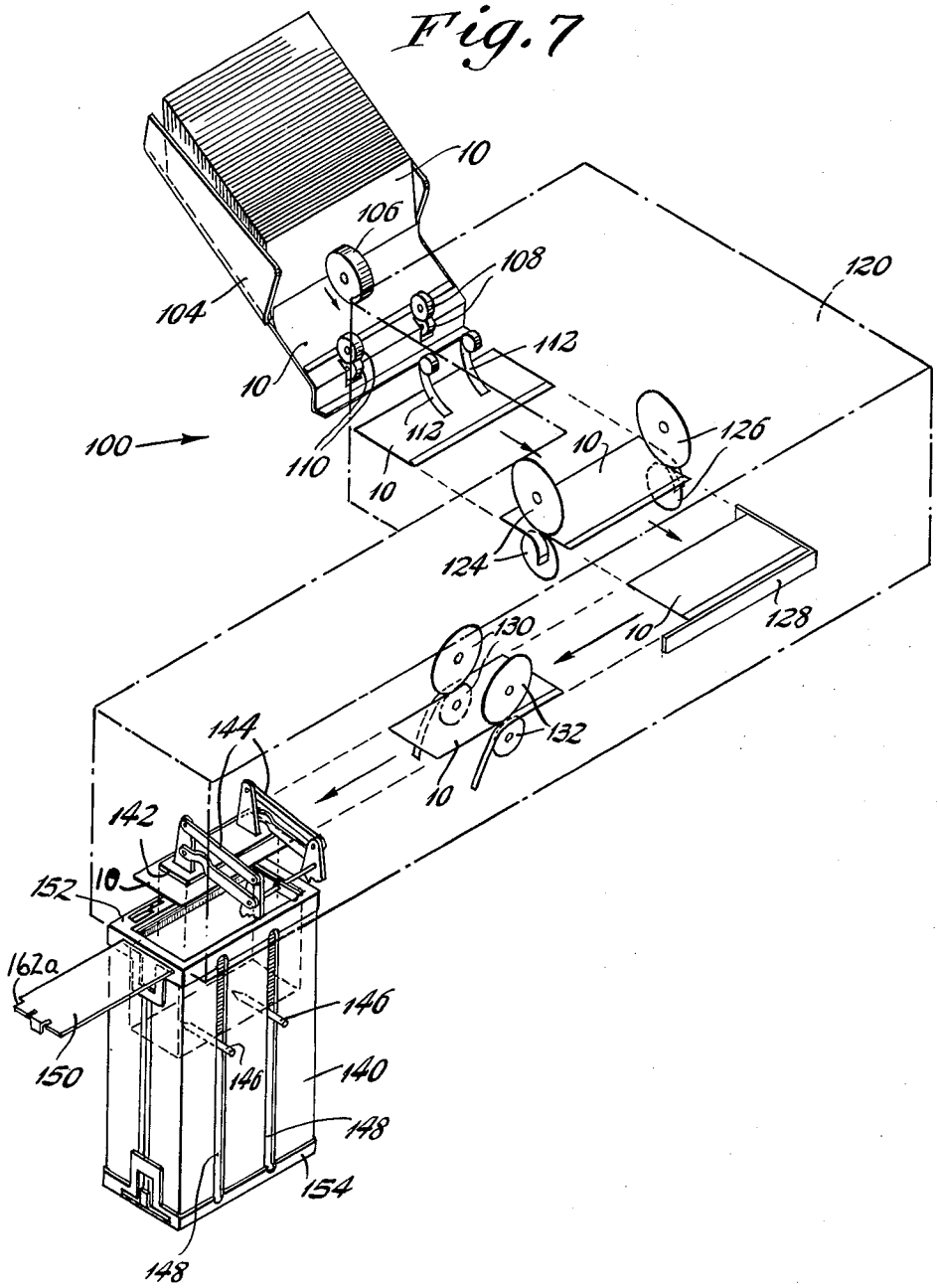
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METHOD OF HANDLING A COMBINATION LETTER-ENVELOPE

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Fig. 7



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METHOD OF HANDLING A COMBINATION LETTER-ENVELOPE

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Fig. 8

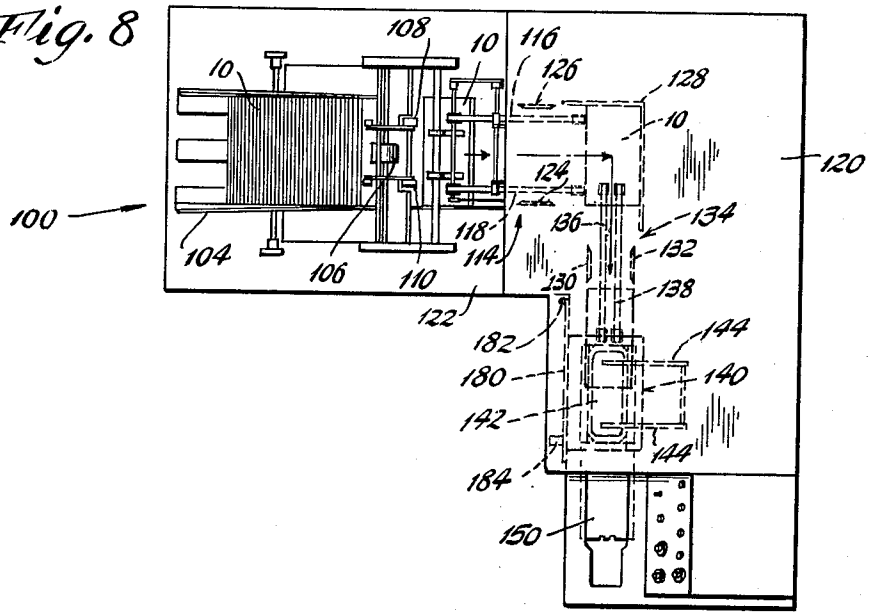
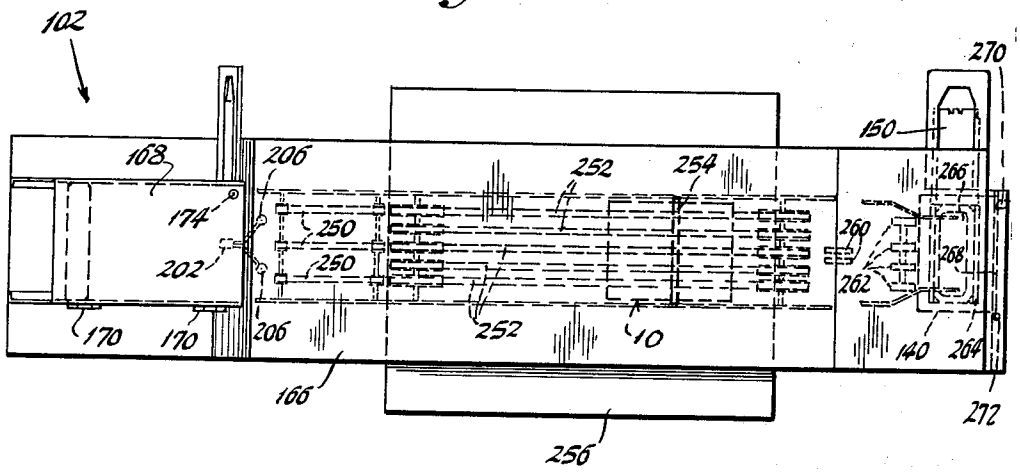


Fig. 9

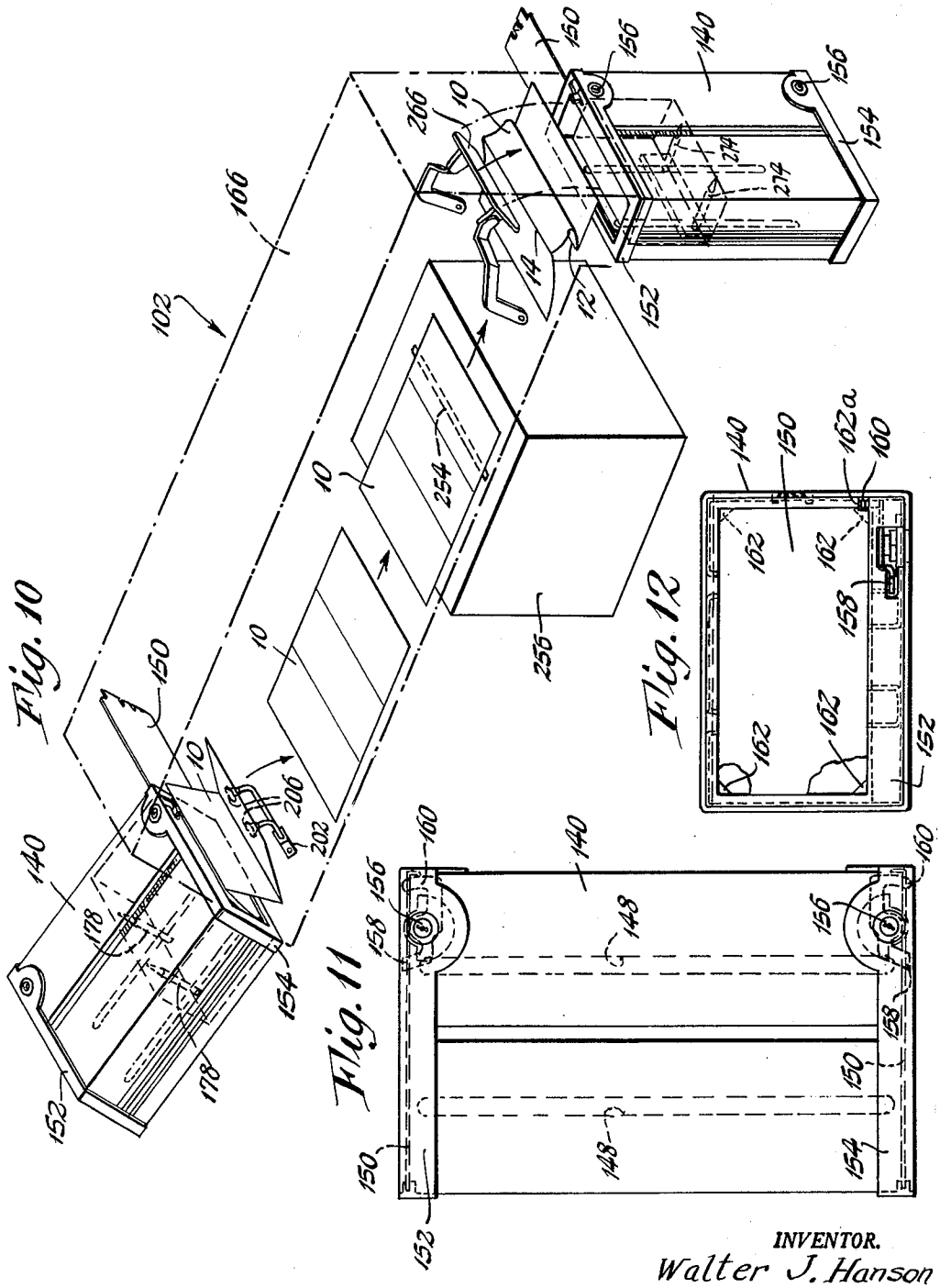


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METHOD OF HANDLING A COMBINATION LETTER-ENVELOPE

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METHOD OF HANDLING A COMBINATION LETTER-ENVELOPE

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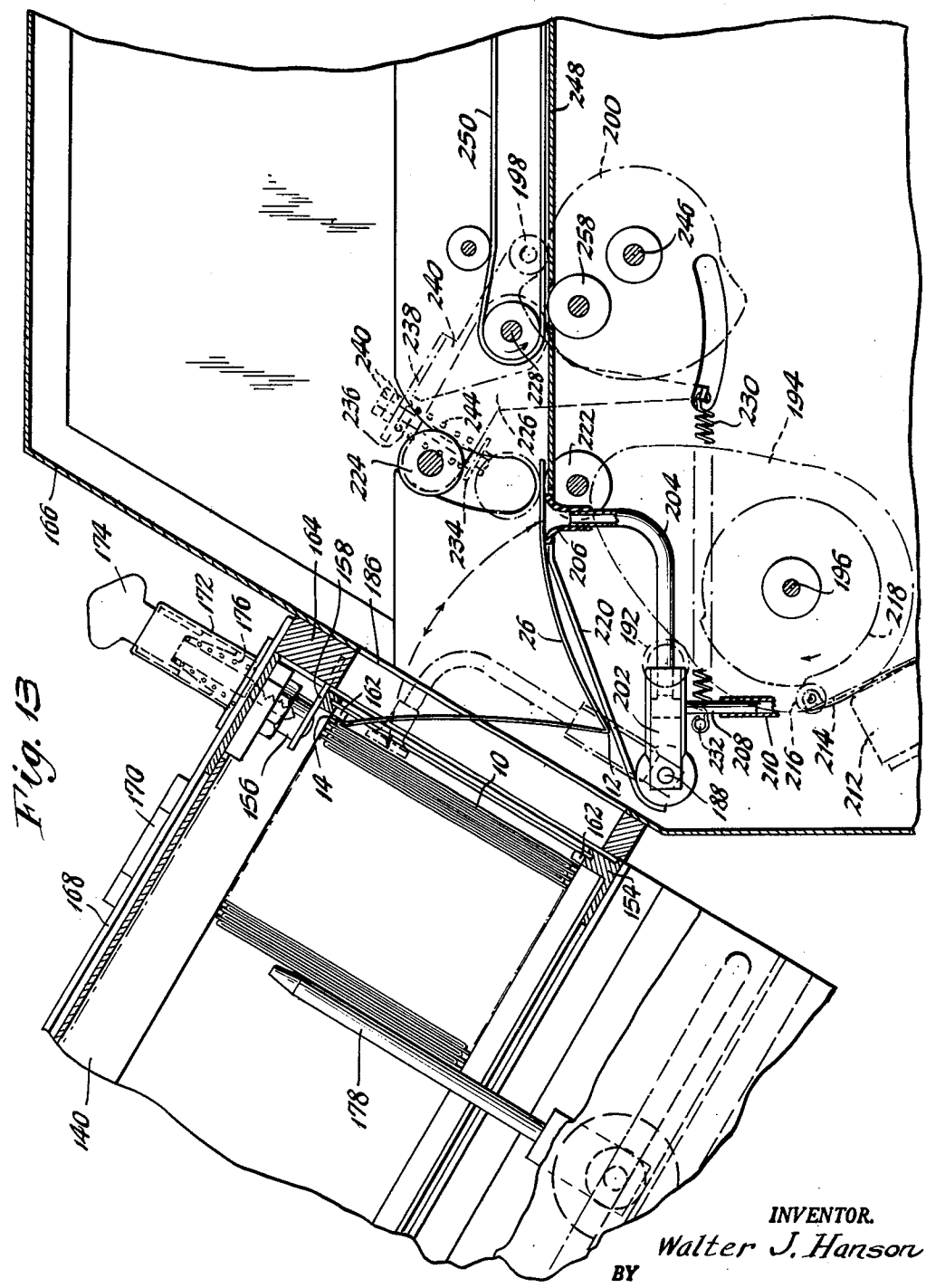


Fig. 13

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United States Patent Office 3,152,800 Patented Oct. 13, 1964

3,152,800

HANDLING A COMBINATION LETTER-ENVELOPE

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Filed Aug. 30, 1961, Ser. No. 135,070
2 Claims. (Cl. 270—1)

This invention relates to a combination letter-envelope useful for sending written messages and to a method of operating upon such a letter-envelope.

With a message-sending system proposed for use by the United States Post Office, written messages are electronically scanned at a first location, transmitted hundreds of miles by microwave transmission to a second location and reproduced at said second location for delivery to a recipient. In addition to speeding up the long-distance transmission of messages which are sent and received in written form, a purpose of this system is to prevent each message from being exposed to any person other than the sender and the intended recipient. At the sending end this latter purpose is accomplished by sealing the originally written message in a combination letter-envelope which remains sealed until the letter-envelope is disposed within the confines of an apparatus, which apparatus maintains the secrecy of the message while automatically opening the letter-envelope and exposing the message to an electronic scanner for transmission.

A combination letter-envelope according to the present invention provides for the requisite secrecy before being disposed within the confines of said apparatus. The method of the present invention provides a unique mode of handling such a letter-envelope to open and unfold the latter and to expose the message written thereon to the scanner while maintaining the requisite secrecy. Alternatively, the combination letter-envelope is useful for sending a written message by ordinary mailing procedures.

Accordingly, an object of the present invention is to provide a new and improved combination letter-envelope.

Another object of the invention is the provision of such a letter-envelope which is adapted to be sealed, thereby to prevent exposure of a message written thereon.

Another object is to provide such a combination letter-envelope with which, before folding, all writing thereon, including the return and destination addresses as well as the message, can appear on one (the upper) surface thereof, and with which, when folded and sealed, the return and destination addresses are exposed to view while exposure of the message is prevented.

A further object is to provide such a letter-envelope which is adapted for automatic handling by an apparatus which opens the sealed letter-envelope and exposes the message written thereon to scanning means.

Another object is the provision of such a letter-envelope which is simple in design and use, and economical to manufacture.

A further object of the present invention is to provide a new and improved method for handling accordion-folded marginally sealed letter-envelopes.

Another object is to provide such a method by which the letter-envelopes are expeditiously opened and unfolded.

Another object is the provision of such a method which lends itself to automatic handling of the letter-envelopes to expose messages written thereon to scanning means while maintaining the messages secret.

Further objects and advantages will become apparent as the description proceeds.

Several embodiments of the invention are shown in the accompanying drawings wherein:

FIG. 1 is a perspective view of a combination letter-envelope according to a first embodiment of the invention;

FIG. 2 is a perspective view showing the letter-envelope of FIG. 1 after partial folding thereof;

FIG. 3 is a perspective view showing the combination letter-envelope after it has been folded flat and sealed, the thickness of the sheet being exaggerated for purposes of illustration;

FIG. 4 is a view similar to FIG. 3 but after the letter-envelope has been trimmed to cut away the sealed portions thereof;

FIG. 5 is a perspective view of a partially folded combination letter-envelope according to a second embodiment of the invention;

FIG. 6 is a perspective view of a combination letter-envelope similar to that of FIG. 1 but according to a third embodiment of the invention whereby a cohesive sealing material is utilized in place of the adhesive sealing material depicted in FIGS. 1–3;

FIG. 7 is a more or less schematic view in perspective of an apparatus illustrating the manner in which the letter-envelopes are trimmed and stuffed into a cartridge according to the method of the present invention;

FIG. 8 is a top plan view of the apparatus of FIG. 7;

FIG. 9 is a top plan view of an apparatus illustrating the manner in which the accordion-folded letter-envelopes are unfolded, scanned, re-folded and stuffed into a cartridge according to the method of the present invention;

FIG. 10 is a perspective view of the apparatus of FIG. 9;

FIG. 11 is a side elevational view of the cartridge which may be utilized in practising the method of this invention;

FIG. 12 is an end view of the cartridge of FIG. 11; and

FIG. 13 is a side elevational view, taken partly in section, of the means for unfolding the accordion-folded letter-envelopes.

A first embodiment of a combination letter-envelope according to the invention is generally indicated at **10**, FIG. 1. The letter-envelope **10** is formed of a sheet of opaque foldable material whose upper surface, at least, is suitable for writing thereon. The letter-envelope **10**, in blank form, is provided with two substantially parallel fold lines **12** and **14**, respectively, which divide the sheet into a top section generally indicated at **16**, a bottom section generally indicated at **18** and an intermediate section generally indicated at **20**.

The top section **16** has a fold line **22** extending across the sheet and substantially parallel to the fold lines **12** and **14** to divide the top section into a top end flap **24** and a top segment **26** foldably connected to each other. In similar fashion, the bottom section **18** has a fold line **28** extending across the sheet and substantially parallel to the fold lines **12**, **14** and **22** to divide the bottom section into a bottom end flap **30** and a bottom segment **32** foldably connected to each other.

Each of the fold lines **12**, **14**, **22** and **28** may take the form of a pre-creased line as exemplified by the fold lines **12** and **14** in FIG. 1. Alternatively, each of the fold lines **12**, **14**, **22** and **28** may take the form of a line of spaced slits as exemplified by the fold lines **22** and **28** in FIG. 1. The use of precreased lines has the advantage of indicating to a user not only the location but also the particular direction in which the fold is to be made. For example, the fold along fold line **12** is made by swinging either one or both of the top section **16** and the intermediate section **20** about the fold line **12** in the direction away from the viewer of FIG. 1, and this direction of folding is indicated by the pre-creasing of the sheet as shown at **12** in FIG. 1. As

is also shown in FIG. 1, the fold along fold line 14 is made by swinging either one or both of the bottom section 18 and the intermediate section 20 about the fold line 14 in the direction toward the viewer of FIG. 1, and again, this direction of folding is indicated by the pre-creasing of the sheet as shown at 14 in FIG. 1.

As denoted by stippling in FIGS. 1 and 2 of the drawing, the upper surfaces of the side margins of the bottom segment 32 are coated with one of the conventional premoistenable adhesives 34. The upper surfaces of the side margins and the free end margin of the bottom end flap 30 are likewise coated with the adhesive 34. Also coated with the adhesive 34 are the lower surfaces of the side margins of the top segment 26, the side margins of the top end flap 24 and the free end margin of the top end flap 24.

In use, the upper surfaces of the intermediate section 20 and the bottom segment 18 are available for writing the message to be sent. For reasons which will later become apparent, the written message should be kept within the bounds defined in part by a U-shaped line 36 (which can be printed on the sheet) and in part by the fold line 12.

At this point it is to be noted that the dimension of each of the top and bottom segments 26 and 32, respectively, in the direction perpendicular to the fold lines 12, 14, 22 and 28, is greater than that of the intermediate section 20 by a respective amount. The respective amount by which this dimension of the top segment 26 is greater than that of the intermediate section 20 need not, but can and ordinarily will, be equal to the respective amount by which this dimension of the bottom segment 32 is greater than that of the intermediate section 20. In addition, the dimension of the top end flap 24, in the direction perpendicular to the fold lines 12, 14, 22 and 28, is greater than the respective amount by which the top segment 24 is greater than the intermediate section 20. In similar fashion, the dimension of the bottom end flap 30, in the direction perpendicular to the fold lines 12, 14, 22 and 28, is greater than the respective amount by which the bottom segment 32 is greater than the intermediate section 20.

After the message has been written on the upper surface of either one or both of intermediate section 20 and bottom segment 32, the blank is folded, as indicated in FIG. 2, about fold lines 12 and 14 in the alternately reversed directions previously described. As also indicated in FIG. 2, top end flap 24 is folded about fold line 22 in the same direction that top segment 26 is folded about fold line 12, and bottom end flap 30 is folded about fold line 28 in the same direction that bottom segment 32 is folded about fold line 14.

Before the blank is folded flat to convert each of the fold lines to a respective fold as shown in FIG. 3, the adhesive 34 is moistened. In folding the blank flat, the top end flap 24 is folded from the position shown in FIG. 2 around the edge now defined by the fold 12 to the position shown in FIG. 3, and the bottom end flap 30 is similarly folded around the edge now defined by the fold 14. This brings each of the respective margins of the blank which are coated with the adhesive 34 into affixed engagement with a respectively coextensive surface of the sheet. In this regard, the now upper surface of the free end margin of the top end flap 24 is affixed to the lower surface of the bottom segment 32; the now lower surface of the free end margin of the bottom end flap 30 is affixed to the upper surface of the top segment 26; and the overlapping side margins of the top segment 26, the intermediate section 20 and the bottom segment 32 are affixed one to another. Also, the side margins of the top and bottom end flaps 24 and 30 are affixed to respective side margins of portions of top segment 26, intermediate section 20 and bottom segment 32, but this is ordinarily not necessary to preserve the secrecy of the message.

Because the dimensions of the top and bottom end flaps, the top and bottom segments and the intermediate section, in the direction perpendicular to the fold lines or folds 12, 14, 22 and 28, are as previously described herein, the fold 22 is spaced outwardly of the fold 14 and the fold 28 is spaced outwardly of the fold 12.

If not already done so, the letter-envelope 10 is addressed and a gummed stamp is placed, both on the upper surface of the top segment 16. It will be apparent that with the embodiment of FIGS. 1–4, as well as with the embodiments of FIGS. 5 and 6 later to be described, all of the writing (including the return address, the destination address and the message) on a combination letter-envelope according to the invention may appear on the upper surface of the letter-envelope when the latter is unfolded; and when the letter-envelope is folded and sealed, the return and destination addresses remain exposed whereas the message becomes hidden from view. If the letter is to be sent by ordinary mailing procedures, the lower surface of the top segment 26 and the lower surface of the intermediate section 20 of the letter-envelope become available for writing at least part of a message thereon, which message become hidden from view when the letter-envelope is folded and sealed. The recipient of the letter-envelope 10 need merely trim or tear away the side margins, the top margin and the bottom margin of the letter-envelope as shown in FIG. 3 to transform the latter into the configuration shown in FIG. 4 whereupon the letter-envelope can be unfolded for reading of the message.

FIG. 5 shows a combination letter-envelope 40 according to a second embodiment which demonstrates that any practical odd number of intermediate sections can be provided. The letter-envelope 40 is identical to that of FIGS. 1–3 except that three intermediate sections 20A, 20B and 20C are provided. The top and bottom segments 26 and 32, and the top and bottom end flaps 24 and 30 are identical to their counterparts in the embodiment of FIGS. 1–3. In order to affix the lower surfaces of the side margins of intermediate section 20A to the upper surfaces of the side margins of intermediate section 20B, conventional premoistenable adhesive can be applied to either one of each two side margin surfaces which are to be affixed to each other. In the embodiment of FIG. 5, this adhesive 34 is provided at the upper surfaces of the side margins of the intermediate section 20B. The same is true of the lower surfaces of the side margins of intermediate section 20B and the upper surfaces of the side margins of intermediate section 20C. In the embodiment of FIG. 5, the adhesive 34 is provided at the upper surfaces of the side margins of intermediate section 20C. As with the folds 12 and 14 of the letter-envelope 10 of FIGS. 1–3, the folds 12, 12A, 14 and 14A of the letter-envelope 40 of FIG. 5 are alternately reversed in direction and are even in number. Also, as with the dimension of the intermediate section 20 of the letter-envelope 10 of FIGS. 1–3, the dimension of each of the intermediate sections 20A, 20B and 20C, in the direction perpendicular to the folds 12, 14, 22 and 28 (and folds 12A and 14A), is smaller than the dimension of each of the top and bottom segments 26 and 32 in the same direction by a respective amount, and this respective amount is smaller than the dimension, in the same direction, of the respective one of the end flaps 24 and 30 foldably connected to the respective one of the top and bottom segments.

FIG. 6 shows a combination letter-envelope 42 according to a third embodiment of the invention. The letter-envelope 42 is or may be identical to the letter-envelope 10 of FIGS. 1–3 except for the sealing means carried thereby. According to the embodiment of FIG. 6, one of the conventional pressure-sensitive cohesives is employed. As is well known, such cohesive material requires no moistening and coheres readily to itself but, except where initially applied does not adhere to other materials such as paper.

If such cohesive material were applied, not to just one

of each two surface portions to be affixed together as is done with the adhesive material in the embodiment of FIGS. 1–3, but to both of each two respective surfaces to be affixed together, a stack of such letter-envelope blanks would have surface portions of each blank become affixed to surface portions of each next adjacent blank. By applying the cohesive material in the pattern shown in FIG. 6, however, this condition is avoided in that no upper surface portion of the blank having cohesive material applied thereto is coextensive with a lower surface portion having cohesive material applied thereto. Consequently, no two abutting, cohesive-coated surface portions of next adjacent blanks of a stack engage each other.

When the blank of FIG. 6 is folded to the configuration shown in FIG. 3, the side margins and the free end margin of both of the end flaps 24 and 30 become affixed to the same respective portions as are the corresponding margins of the blank of FIG. 1. Each spot of cohesive material at the side margins of each one of the top segment 26, the intermediate section 20 and the bottom segment 32 also becomes affixed to the same respective portion as the corresponding part of the blank of FIG. 1. Of course, the number, size and spacing of the spots of cohesive material at the side margins of the top and bottom segments and the intermediate section can be varied, depending upon the overall size of the blank, to assure that the secrecy of the message is maintained.

In place of the adhesive material 34 of FIGS. 1 and 5 and the cohesive material 44 of FIG. 6, the respective side margins and free end margins (or side edges and free ends) of a letter-envelope folded to the condition of FIG. 3, can be affixed by applying any suitable adhesive-coated tape such as cellophane tape or masking tape in overlapping relation to the respective side edges and free ends to be affixed.

According to the method of the present invention, a stack of accordion-folded, marginally sealed letters or sheets, such as the one shown in FIG. 3 or any of the other letter-envelope embodiments described herein, have their sealed margins trimmed away and are stuffed into a cartridge by a trimming and stuffing machine generally designated at 100 in FIG. 8. The cartridge containing the trimmed sheets is then associated with a machine generally designated at 102 in FIG. 9, and the trimmed sheets are unfolded, scanned by a scanning device of a microwave transmission apparatus, re-folded and stuffed back into another cartridge.

Referring to FIG. 7 along with FIG. 8, a stack of message-bearing, accordion-folded and marginally sealed sheets 10 is placed in a hopper 104 of the machine 100. In one-by-one succession the folded and sealed sheets 10 are separated from the rest of the stack and forwardly fed by a separator roller 106 to two pairs of feed rollers 108 and 110. For details of the operation of the hopper 104, separator roller 106 and feed rollers 108, 110, reference may be had to U.S. Patent No. 2,736,999 granted on March 6, 1956, to F. J. Rouan et al. The marginally sealed sheets 10 are fed by the pairs of rollers 108, 110 past two downwardly inclined deflectors 112 to a conveyor generally indicated at 114. The conveyor 114 includes two pairs of opposing feed belts 116, 118 which forwardly feed each successive sheet 10, with one of the longer edges of the latter foremost, into a sanctity chamber defined by a housing 120. The housing 120 encloses each successive sheet 10 and all of the mechanism which operates on each sheet from the time the latter enters the housing until the respective sheet leaves the housing. The housing 120 or at least a releasably secured part of it is locked in place to the frame 122 of the machine 100 so that access to any sheet 10, once that sheet enters the housing, is prevented by the housing until, of course, that sheet leaves the housing.

After feeding each sheet 10 into the housing 120, the pairs of feed belts 116, 118 feed the respective sheet past two pairs of rotary trimming blades 124, 126 to a momentary stop position defined by a right-angle frame member 128. As best shown in FIG. 7, the blades 124, 126 trim away the sealed margins of both of the shorter sides of the sheet 10 while the latter is being fed therepast.

From the momentary stop position at the frame member 128, each successive sheet 10 is fed, with one of the shorter edges of the latter foremost, past two pairs of rotary trimming blades 130, 132 by another conveyor generally designated at 134. The conveyor 134, in conventional fashion, includes two pairs of opposing feed belts 136, 138. As can be seen in FIG. 7, the pairs of rotary blades 130, 132 trim away the sealed margins of both of the longer sides of the sheet 10.

After being trimmed by the blades 130, 132, each successive sheet 10, which is now in the form of an unsealed accordian-folded sheet, is fed to a stop position directly above the open end of a cartridge 140 and directly below a cartridge-stuffing plate 142. The cartridge 140 is locked to the housing 120 and provides a constriction at its open end, all as will be later described. The cartridge-stuffing plate 142 is cyclically reciprocated from an upper retracted position to a lower advanced position and back to the retracted position by a parallel linkage 144 driven in synchronium with the feed of the sheets 10 by means not shown. After each trimmed accordion-folded sheet 10 arrives at the stop position above the open end of the cartridge 140, the cartridge-stuffing plate 142 advances to push the sheet past the constricted opening of the cartridge and into the latter. A pair of pins 146 project through two slots 148 provided by one of the larger sides of the cartridge 140. The pins 146 support the stack of sheets 10 which builds up as the successive sheets are stuffed into the cartridge. The pins 146 are supported against their weight and the weight of the stack by means (not shown) which yields at the same rate the stack builds up whereby no skewing or other misalignment of the letters of the stack occurs.

When the cartridge 140 is filled with a stack of trimmed and folded letters, further feeding of the sheets 10 is stopped. The open end of the cartridge 140 is closed by sliding a door 150 thereof (FIG. 7) to closed position, the door 150 is locked in the closed position, and the cartridge is unlocked from the housing 120 and removed therefrom. This is accomplished in the same manner that the cartridge 140 and its door 150 are locked and unlocked when associated with the machine 102, as will now be described.

Referring to FIGS. 11, 12 and 13 along with FIGS. 7 and 10, each cartridge 140 includes an open rectangular frame 152 at one end and an open rectangular frame 154 at the other end. The two frames 152 and 154 and the appurtenant structure at each end of each cartridge are mirror-image duplicates of each other, and only one will therefore be particularly described. The frame 152 mounts a respective door 150 for slidable movement between open and closed positions. The frame 152 also mounts a key-lock including a barrel 156. The barrel 156 carries two locking fingers 158 and 160, respectively, both of which are integral and move with the barrel. With the door 150 closed and the fingers 158 and 160 in the position shown in FIG. 11, the distal end of the finger 160 projects past a square notch 162*a* cut out of the adjacent corner of the door 150, thereby locking the latter in the closed position.

The dimensions of the rectangular opening provided by each frame 152 and which is closed by the door 150, are slightly larger than the corresponding dimensions of folded rectangular sheets 10 after the latter have been trimmed by the blades 124, 126 and 130, 132. This rectangular opening is constricted, however, by a fillet 162 at each inner corner thereof. The fillets 162 are integral with the frame 152 and lie just behind the door 150 (see FIG. 13). The dimensions of the interior of the cartridge 140 are the same as those provided by the rectan-

gular opening of the frame 152 exclusive, of course, of the fillets 162.

After being removed from the machine 100, the filled cartridge 140 is placed with its frame 152 in engagement and coextensive with a rectangular abutment 164 carried by a housing 166 of the machine 102 (FIG. 13). A door 168 is supported by hinges, one of which is shown at 170 in FIG. 13, for pivotal movement toward and away from the cartridge 140. The door 168 carries a tubular member 172 which supports a key 174 for rotatable and telescoping movement therewithin. A spring 176 resiliently biases the key 174 toward its outward position. When the door 168 is swung into engagement with the cartridge 140 as shown in FIG. 13, the key 174 is aligned with a keyhole in the barrel 156 of the lock so that the key can be pressed inwardly against the bias of the spring 176 and into the lock. The key 174 is then rotated approximately ninety degrees and, as previously noted, this retracts the distal end of the finger 160 from the notch 162*a* of the door 150, thereby unlocking this door. The door 150 can then be slid to the open position.

When the key 174 is rotated to unlock the door 150, the distal end of the finger 158 swings into a complementary recess provided by the abutment 164, thereby locking the cartridge 140 to the housing 166 of the machine 102. Since the key 174 is irremovably carried by the door 168 of the machine 102, the door 150 of the cartridge can only be unlocked when in juxtaposition with the housing 166. When this is properly done, the cartridge becomes locked to the housing 166 and, during the interval from unlocking of the cartridge from the housing 120 until it is locked to the housing 166, access to the trimmed sheets 10 within the cartridge has been prevented.

Before the cartridge 140 is placed in juxtaposition to the housing 166 as shown in FIG. 13, a gravity or otherwise advanced pair of pins 178 are retracted (to the left and upwardly as viewed in FIG. 13) and then inserted into the slots 148 of the cartridge at a point behind the rearmost sheet 10 of the stack within the cartridge. The pins 178 yieldably bias the stack in the direction toward the end of the cartridge which is locked to the housing 166.

As previously noted, the cartridge 140 was previously locked to (and unlocked from) the housing 120, and the respective door 150 was locked (and unlocked) in the closed position in the manner described above whereby the cartridge was locked to the housing 166 and the respective door 150 was locked. Referring back to FIG. 8 in this regard, the door 180 corresponds in structure and function to the door 168 of FIG. 13; the door 180 being hinged to the frame 122 at 182 and carrying a key 184. It is to be noted that the trimmed sheets 10 are stuffed from the housing 120 of the machine 100 into the end of the cartridge defined by the frame 152. The trimmed sheets are fed out of the cartridge in one-by-one succession from the end of the cartridge defined by the frame 154 into the housing 166 of the machine 102, whereby the trimmed sheets enter and leave the cartridge in the same order (i.e., first in is first out and last in is last out).

The rectangular abutment 164 surrounds an aperture 186 in the housing 166 through which the folded and trimmed sheets 10 enter this housing, as will now be described. Disposed within the housing 166 is a rock shaft 188 to which is secured a lever (not shown) mounting a cam follower roller 192. The rock shaft 188 swings back and forth cyclically by means of a cam 194 fixed on a rotatably driven shaft 196; the roller 192 following the outer periphery of this cam. Spring means can be utilized to bias the roller 192 against the periphery of the cam in the same manner that a cam follower 198 is biased against the periphery of a cam 200, as will later be described.

The rocker shaft 188 also has a hollow bracket 202 secured thereto. The hollow interior of the bracket 202 is in communication with a pair of right-angularly bent rigid tubes 204 carried by the bracket 202. A funnel-shaped suction cup 206 formed of soft rubber is carried at the distal end of each of the tubes 204. The hollow interior of the bracket 202 also communicates with a short rigid tube 208 connected by a flexible tube 210 to a sub-atmospheric pressure source through an electrically operated valve (not shown). This valve is controlled by a switch 212 having a leaf spring actuator 214 which carries a cam follower roller 216. The roller 216 is urged by the leaf spring actuator against the periphery of a cam 218. The cam 218 is fixed on the shaft 196 and operates the switch 212 in synchronism with rocking of the shaft 188. The switch 212 is tripped while riding on the high segment of the cam 218 and is untripped while riding on the low segment thereof. When the switch 212 is tripped, the valve operated thereby connects the flexible tube 210 to the sub-atmospheric pressure source, and when the switch 212 is untripped this valve closes off the sub-atmospheric pressure source and vents the tube 210 to the atmosphere.

With the shaft 196 rotating in the clockwise direction as viewed in FIG. 13, the leading portion of the non-circular segment of the cam 194 rocks the two suction cups 206 in the counterclockwise direction and, shortly before the suction cups reach the foremost sheet 10 of the stack within the cartridge 140, the high segment of the cam 218 trips the switch 212 whereby sub-atmospheric pressure prevails inwardly of the suction cups. When the suction cups reach the foremost sheet 10, they take hold of the fold section 26 of that sheet and then rock in the counterclockwise direction as the cam follower roller 192 rides on the trailing portion of the non-circular segment of the cam 194. In this manner, the fold section 26 is pulled past the constricted opening provided by the frame 154 and onto an inclined plate 220 as shown in FIG. 13. The plate 220 is appropriately slotted for movement of the hollow bracket 202 and tubes 204 back and forth therepast.

When the parts reach the respective positions shown in FIG. 13, the switch 212 is still in the tripped condition so that the fold section 26 is being held by the vacuum cups 206 with the distal end of the fold section 26 overlying a driven feed roller 222. At this point, an idler feed roller 224 is moved downwardly against this overlying portion of the fold section 26 and the latter is thereby urged against the driven feed roller 222 as will now be described.

The idler feed roller 224 is mounted for free rotation at one end of a bell crank lever 226. The bell crank lever 226 is mounted for rotation about a shaft 228. A tension spring 230 is connected at one end to a fixed post 232 and at its opposite end to the lower end of the bell crank lever 226 whereby the latter is resiliently biased in the clockwise direction as viewed in FIG. 13. The bell crank lever 226 carries a laterally extending lug 234 to which a bolt 236 is fixed. The bolt 236 extends through an aperture in a transversely extending lug 238 carried by a lever 240 and into threaded engagement with a pair of nuts 242. A compression spring 244 is retained about the bolt 236 and between the lugs 234 and 238.

The lever 240 is also mounted for rotation about the shaft 238 and carries the cam follower roller 198. The cam 200 is driven by a shaft 246 which is driven in the clockwise direction in synchronism with the shaft 196. With the parts in their respective positions as shown in FIG. 13, clockwise rotation of the cam 200 causes both of the levers 226 and 240 to swing in the counterclockwise direction until the idler feed roller 224 presses the overlying portion of the fold section 26 of the sheet 10 against the driven feed roller 222. Just before this occurs, the switch 216 becomes untripped whereby the tubes 204 are vented to atmospheric pressure and the suction cup 206 release the sheet 10. As the roller 224 presses the sheet 10 against the driven roller 222, the

spring 244 yields permitting movement of the lever 240 relative to the lever 226 and the sheet 10 is fed forwardly to the bite between a feed deck 248 and three feed belts 250.

It will be clear, then, that the suction cups 206 initially pull an end portion of each sheet 10 past the constricted opening provided by the frame 154 of the cartridge 140, and the remainder of the respective sheet is pulled past the constricted opening by force applied to the sheet at a location past the constricted opening by the suction cups 206 and then by the feed rollers 222, 224 and feed belts 250. In this manner, the portions of the sheet 10 at each of the two transverse fold lines 12 and 14 are successively pulled past the constricted opening whereby the sheet 10 is unfolded. It is noted that the sheet 10 is partially unfolded by the suction cups 206 and then is completely unfolded and simultaneously forwardly fed by the feed rollers 222, 224 and feed belts 250. Each sheet 10 is unfolded and forwardly fed from the cartridge 140 past the constricted opening and directly into the sanctity chamber 166. The rate at which the suction cups 206 swing back and forth is such as to provide a short space between each two successive sheets 10 as they are forwardly fed by the belts 250.

The upper one of each pair of the feed belts 136, 138 can be pivoted back and forth at the respective end portion thereof adjacent the L-shaped frame 128 in the same manner that the feed roller 224 is pivoted back and forth whereby downward feeding (as viewed in FIG. 8) of each folded sheet 10 will not begin until the rightward feeding thereof by the pairs of feed belts 116, 118 is completed.

Referring to FIGS. 9 and 10, the feed belts 250 feed each successive sheet 10 into the bite between the lower reach of five side-by-side feed belts 252 and the feed deck 248. The feed belts 252 feed the sheet 10 with the message on the front surface of the sheet facing the feed deck 248. This feed deck has a transverse slot 254 therein through which a scanner 256 scans the message for microwave transmission. A series of idler rollers such as the one shown at 258 in FIG. 13 is provided to reduce the friction between the belts 250 and the feed deck 248.

After the message is scanned, the sheet bearing that message can be fed directly into a shredder or other apparatus for obliterating the message. Alternatively, the respective sheet 10 can be re-folded and placed in another cartridge 140. After each cartridge is filled, it can be stored for later access or the respective folded sheets can be inserted from the cartridge into envelopes and mailed by ordinary mailing procedures as confirmation copies. To accomplish such re-folding and insertion into a cartridge, means such as that shown in FIGS. 9 and 10 can be utilized. This means includes two pairs of opposed feed rollers 260 to which each successive sheet 10 is fed by the belts 250 and by which each successive sheet is fed to four pairs of opposed feed rollers 262. The feed rollers 262 are driven at a somewhat greater peripheral speed than that at which the feed rollers 260 are driven. The feed rollers 260 are driven at a peripheral speed substantially equal to that at which the belts 250 are driven, and the feed rollers 260 are driven through an overriding clutch. Consequently, the feed rollers 262 take away each sheet 10 from the feed rollers 260 at a greater speed than that at which the feed rollers 260 feed the sheet to the feed rollers 262. This increase in speed of feeding provides additional time for the re-folding means to operate, as will now be described.

The feed rollers 262 feed the sheet 10 forwardly to bring the leading edge of the sheet into engagement with a stop 264. With continued feeding of the sheet by the feed rollers 262, the sheet buckles along the fold line 12 and then buckles along the fold line 14 as indicated in FIG. 13. Further feeding of the sheet by the feed rollers 262 brings the three sections of the sheet into overlapping relation to each other. When this occurs, a stuffing plate 266 swings forwardly and downwardly about a pivot to press the sections of the sheet flat against each other and to stuff the sheet past the constricted opening of a cartridge 140. To provide sufficient time for the stuffing plate 266 to operate without requiring an excessive space between the successively fed sheets, the feed rollers 262 are driven faster than the feed rollers 260 and the latter are driven through an overriding clutch, all as previously described. A door 268 (FIG. 9) which carries a key 270 and is hinged at 272 corresponds in structure and function to the door 168 described above in connection with FIG. 13. A pair of pins 274 (FIG. 10) operate in the same manner as the pins 146 in FIG. 7.

The housing 120 of the machine 100, the housing 166 of the machine 102, and the cartridges 140 provide sanctity enclosures in that access for human reading of a message on a sheet 10 disposed therewithin is prevented. No access for human reading is available before each sheet 10 is fed into the housing 120 because, of course, the sheet 10 is then folded and marginally sealed. After being trimmed, each sheet is stuffed from the housing 120 directly into a cartridge 140, then is unfolded from this cartridge directly into the housing 166 where the respective message is scanned, and then the sheet is inserted directly into another cartridge 140 or directly into a message-obliterating means. In this manner, the successive sheets are trimmed, unfolded and scanned while the messages carried thereby remain inaccessible for human reading.

Among the advantages of utilizing the two separate machines 100 and 102, as opposed to combining the functions of these two machines in a single machine, is the one that the operating rate (sheets per unit time interval) and the down time (for adjustment, repair, etc.) of neither machine is limited to that of the other.

Since many changes can be made in the embodiments of the invention particularly described and shown herein without departing from the scope of the invention, it is intended that these embodiments be considered as exemplary and that the invention not be limited except as warranted by the following claims.

What is claimed is:

1. A method of operating upon a message-bearing, accordian-folded, marginally sealed sheet for exposing the message on the sheet to scanning means while maintaining the sanctity of the message; said method comprising the steps of inserting said sheet into a first sanctity chamber; trimming away the sealed margins of said sheet while the latter is within said first sanctity chamber; stuffing the trimmed sheet from said first sanctity chamber directly into a sanctity cartridge having an opening at one end smaller than the folded sheet; initially pulling an end portion of the sheet past and through said opening directly into a second sanctity chamber; then pulling the remainder of the sheet past and through said opening directly into said second sanctity chamber by force applied to the sheet at a location within said second sanctity chamber but outside said cartridge whereby the sheet unfolds into the second sanctity chamber; and while within said second sanctity chamber, exposing the message on the unfolded sheet to the scanning means.

2. A method of operating upon message bearing, accordian-folded, marginally sealed sheets for exposing the message on each sheet to scanning means while maintaining the sanctity of each message; said method comprising the steps of inserting said sheets into a first sanctity chamber in one-by-one succession; trimming away the sealed margins of each successive sheet while the latter is within said first sanctity chamber; stuffing each successive trimmed sheet from said first sanctity chamber directly into a sanctity cartridge having an opening at one end smaller than the folded sheets; initially pulling an end portion of each successive trimmed sheet past

and through said opening directly into a second sanctity chamber, and then pulling the remainder of that trimmed sheet past and through the opening directly into said second sanctity chamber by force applied to that trimmed sheet at a location within said second sanctity chamber but outside said cartridge whereby that trimmed sheet unfolds into the second sanctity chamber; and exposing the message on each successive unfolded sheet to the scanning means while each unfolded sheet is within said second sanctity chamber.

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