Oct. 12, 1954 M. E. HAWLEY 2,691,327

ENVELOPE ASSEMBLING APPARATUS

Filed Aug. 27, 1953 3 Sheets-Sheet 1

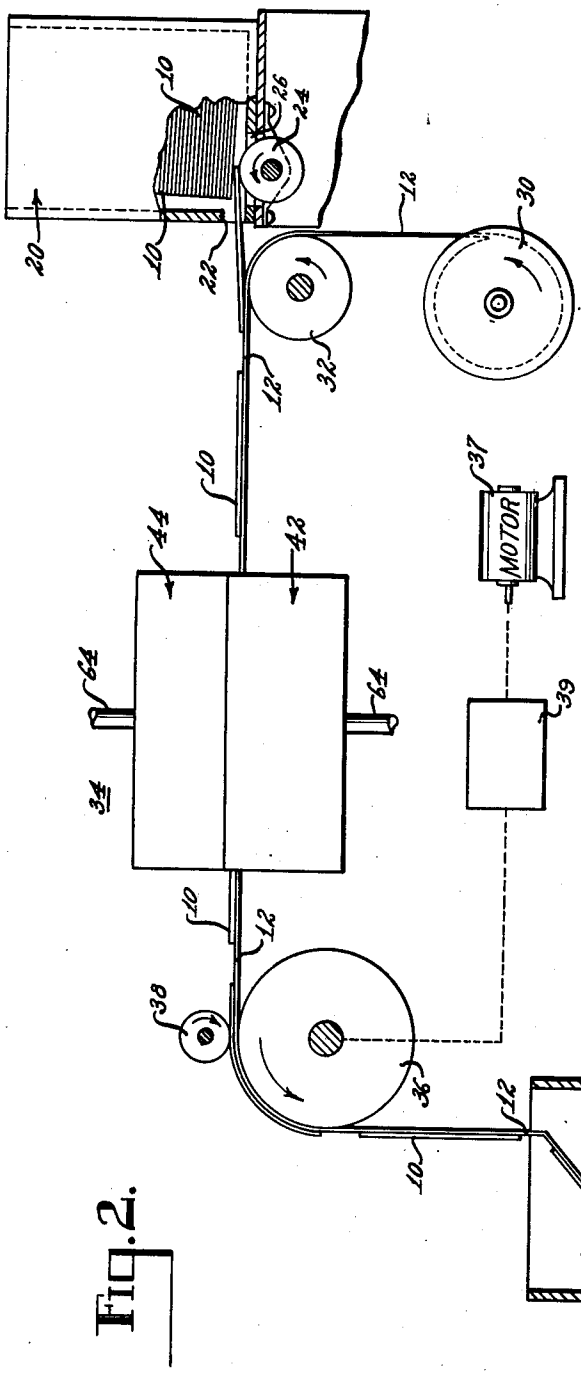



Fig. 2.

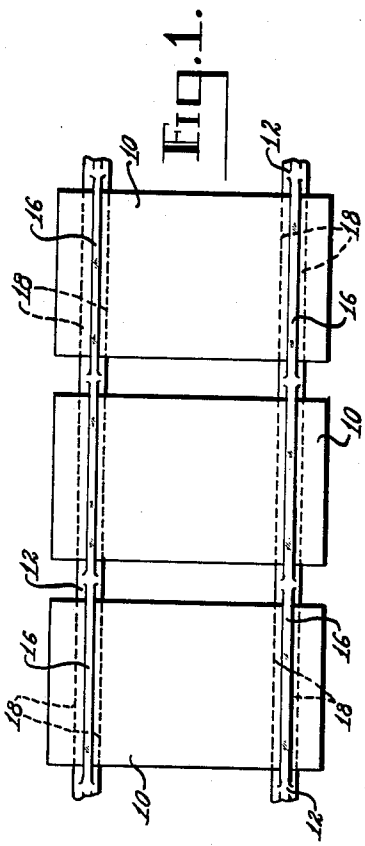


Fig. 1.

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ENVELOPE ASSEMBLING APPARATUS

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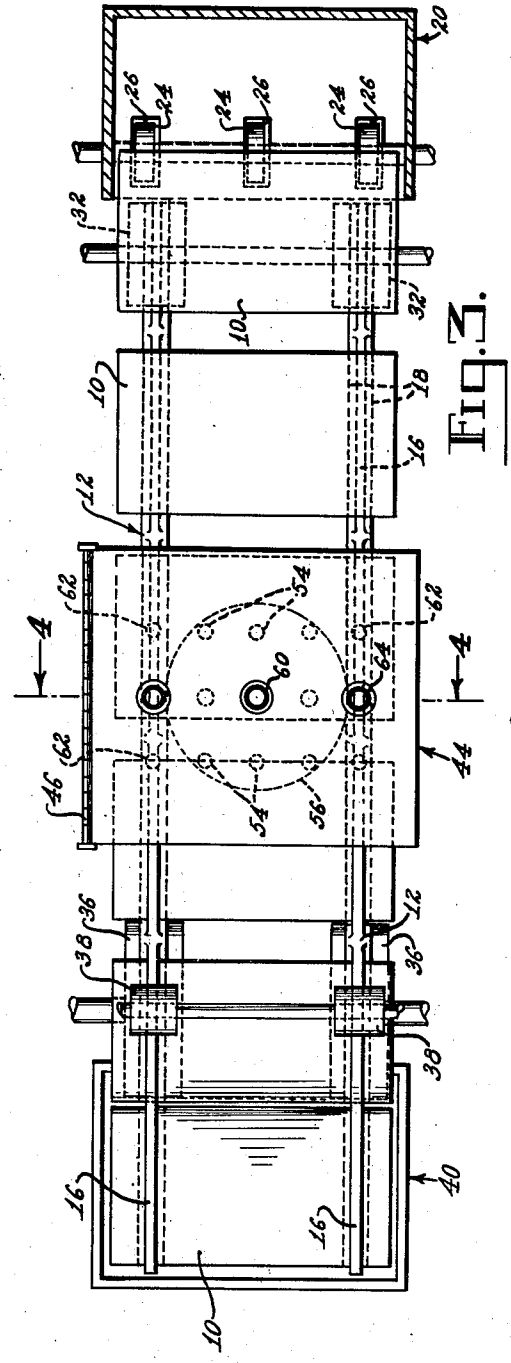



Fig. 2.

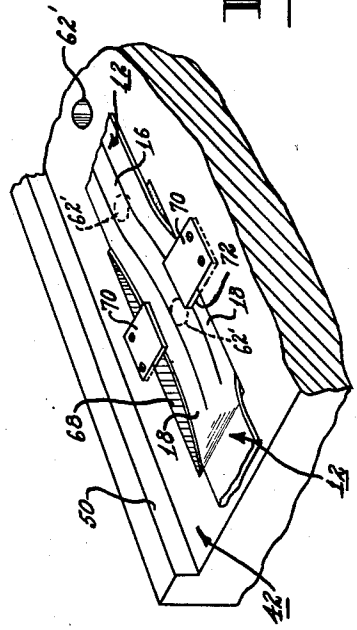



Fig. 7.

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ENVELOPE ASSEMBLING APPARATUS

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Fig. 4.

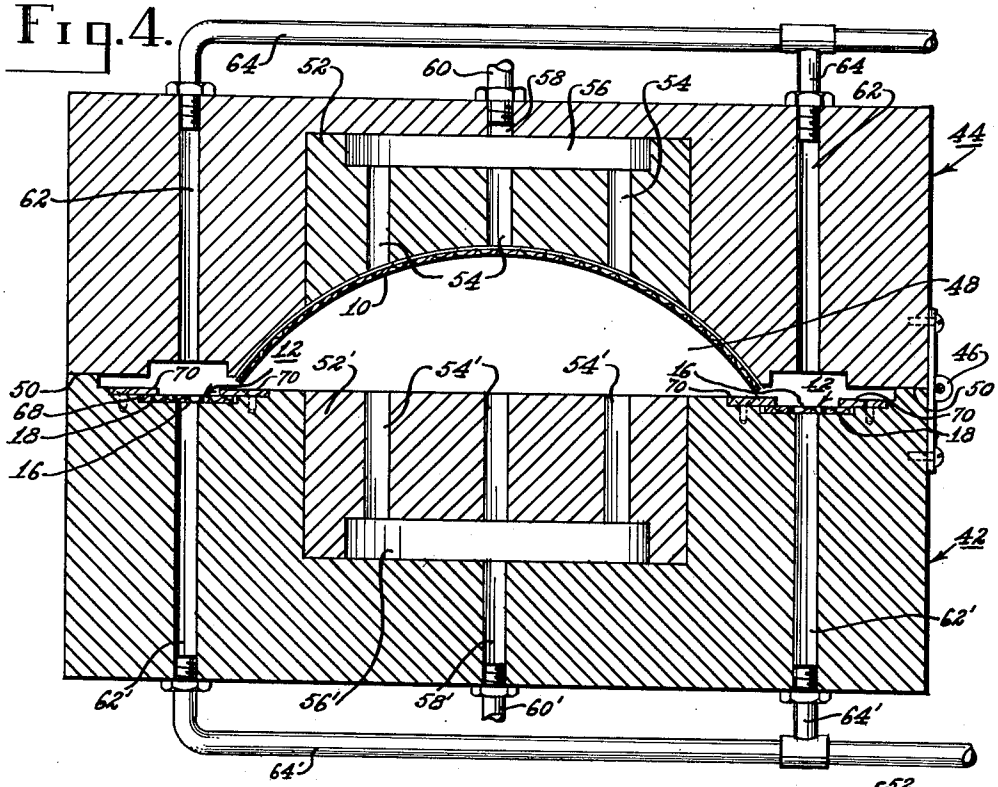
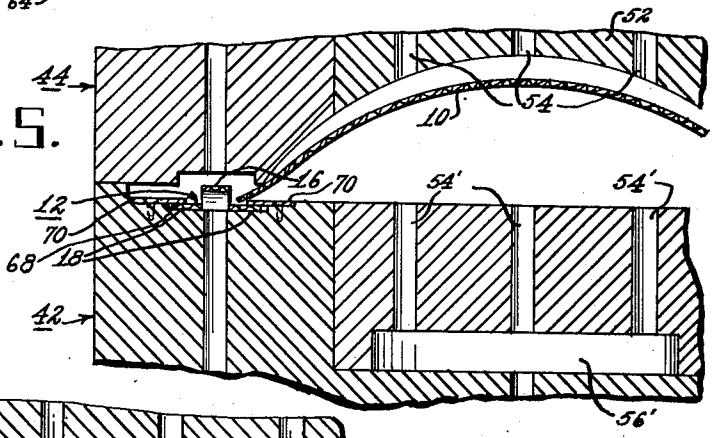



Fig. 5.



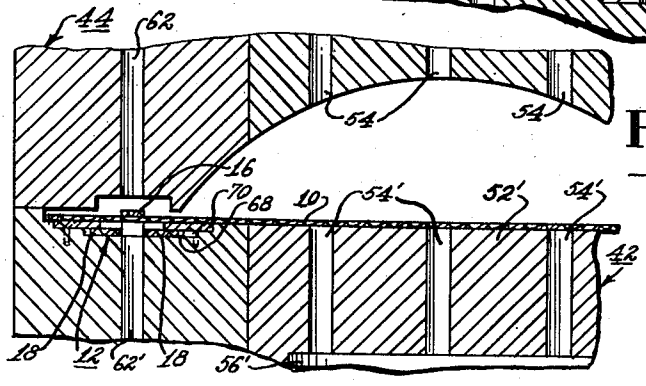




Fig. 6.

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# UNITED STATES PATENT OFFICE

2,691,327

## ENVELOPE ASSEMBLING APPARATUS

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Application August 27, 1953, Serial No. 376,950

6 Claims. (Cl. 93—1)

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This invention relates to envelope packaging and more particularly to apparatus for mounting envelopes and the like onto continuous tapes having loops formed therein to hold the envelopes in alignment.

In a copending application for U. S. Letters Patent, Ser. No. 358,690, filed June 1, 1953, by the present inventor, there is disclosed a novel assembly of envelopes and continuous tapes wherein the tapes are provided with intermittent loops into which the envelopes are inserted and which hold the envelopes in series alignment. The present invention is directed to apparatus which will assemble the envelopes and tapes by causing a portion of successive envelopes to be inserted into the loops of the continuous tapes. In accordance with the present invention, the tapes are fed into a threader by any suitable mechanism and the envelopes are carried individually into the threader on the tapes. Within the threader, the ends of the envelopes are pulled away from the tapes while the loops are opened to receive the envelope ends. When the envelope is returned to its original position, the ends thereof slide into the loops.

An object of this invention is to provide a novel apparatus which will assemble a series of envelopes in alignment on a continuous tape.

Another object of this invention is to provide a novel machine capable of selecting individual envelopes, and causing a portion of each envelope to be inserted into intermittent loops of a continuous tape being fed through the machine.

A further object of this invention is to provide a machine which will insert a series of individual envelopes into the intermittent loops of a continuous tape so that the assembly may be fed continuously through a typewriter or the like.

Another object of this invention is to provide an automatic machine of the above type which is simple, efficient and well adapted to the purposes for which it is intended.

Other objects and advantages of the present invention will, of course, become apparent and immediately suggest themselves to those skilled in the art to which the invention is directed from a reading of the following specification in connection with the accompanying drawings in which:

Figure 1 is a fragmentary view of one form of envelope assembly which can be assembled by practicing the present invention;

Figure 2 is a view in elevation of one form of the apparatus according to the invention;

Figure 3 is a plan view of the apparatus shown in Figure 2;

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Figure 4 is a view, in sectional elevation of the threader portion of the apparatus of Figures 2 and 3 taken along the line 4—4 of Figure 3 and showing an envelope pulled away from the tape;

Figure 5 is a partial view of the apparatus of Fig. 4 in which the loops in the tapes have been opened;

Figure 6 is a view similar to Figure 5 showing the envelope held in the loops; and

Figure 7 is a detail view of a portion of the threader base.

Referring to the drawings in more detail, Figure 1 shows an assembly described in my above-mentioned application in which three standard envelopes 10 are held in alignment by a pair of continuous tapes 12. These tapes 12 are provided with intermittent pairs of longitudinal slits 14 which divide the tapes, in the slitted areas, into a central portion 16 and two edge portions 18. The central portions 16 are displaced from the edge portions 18 to form intermittent loops in the tapes 12 which hold the envelopes 10.

In the embodiment of this invention, exemplified in Figures 2 and 3, the loose envelopes 10 are placed in a suitable box or magazine 20 such, for example, as is described in U. S. Patent No. 2,443,953, issued to C. N. Gillespie and especially shown in Figure 4. The envelopes stacked in the box 20 are projected, one at a time, through a slot 22 by means of rollers 24 which project upwardly through slots 26 in the bottom of the box 20.

The tape 12 travels from a supply reel 30 over a roller 32 then through the section of the apparatus designated as a threader 34 where the envelopes and tape are assembled. The assembly then passes through tension rollers 36 and 38 and into a collecting hopper 40. The roller 36 may be driven from a suitable motor 37 through an intermittent drive mechanism 39 of any known type. The intermittent movement will correspond to the pitch of the tape 12; in other words, each intermittent movement will advance the tape 12 a distance corresponding to the distance between the beginning, for instance, of adjacent slits. The rollers 24 of the box 20 may also receive driving power from the motor 37 in any suitable manner (not shown).

The threader 34, as shown in Figures 4, 5 and 6, consists of a base portion 42 and a top portion 44 connected by a hinge 46 located at the end of the threader. The hinge 46 permits the opening of the threader 34 for inserting the tapes, making adjustments and the like.

The threader top 44 is provided with an arched chamber 48 so dimensioned that when

an envelope is held against the under surface of the arch by suction, for example, the ends thereof will be pulled away from the paths of the tapes through the threader. The threader base **42** is provided with lips **50** at either end which support the top **44** when the threader is closed. These lips **50** also form the ends of the elongated bottom portion of the chamber **48** through which the envelopes pass in their normal flat state. Both the top **44** and the base **42** of the threader **34** have a number of holes for the passage of air, the arrangement of which is best shown in Figures 3 and 4. Since the arrangement of these air passages and connected parts are similar for both the top and the base of the threader, these parts will be described for the top only and the corresponding parts for the base will be indicated on the drawings by the same reference numbers primed. An insert **52** sealed into the top **44** contains air passages **54** which terminate on one end at the arched surface thereof and at the other end in a circular header **56**. A passage **58** connects the header **56** with an external conduit **60**. In addition, two parallel rows of passages **62** are aligned over the paths of the tapes and are connected to external conduits **64**. The above-mentioned external conduits **60** and **64**, along with the corresponding conduits **60'** and **64'** for the base, are connected alternately through suitable valves (not shown) to a source of air pressure and vacuum pump or the like neither of which is shown. A portion of the conduits may be of hose or the like (not shown) so that the threader may be opened easily.

Figure 7 shows one means which may be provided for guiding the tapes **12** through the threader **34** and also for holding down the edge portions **18** of the tape when the central portion **16** is displaced. This guiding means comprises one or more depressions **68** in each of the tape paths, which depressions are slightly wider than the width of the tape. Two strips of material **70**, for each depression **68**, are inserted in the base **42** so that they are flush with the top surface of the base and form an overhang **72** on opposite sides of the depression **68** to hold the edge portions **18** of the tape down as it passes through the depression. One of a pair of depressions in one tape path is shown.

A description of the operation of the apparatus described above will now be given. The manner in which the envelopes **10** are placed in the box **20** is immaterial so long as they are uniformly oriented in the box. The tapes **12** will be driven by the tension rollers **36** and **38** by means of an intermittent drive **39**. The rollers **24**, associated with the box **20**, must be linked to the above-mentioned drive by any suitable mechanism, so that at each intermittent movement of the tape an envelope will be projected thereon from the box. The envelopes will then be carried into the threader **34** on the tapes. When an envelope is in position for the threading operation, it will be forced upward into the arched chamber **48** of the threader top **44** by positive air pressure from the passages **54'** in the base **42** and may be aided by a suction pressure from the passages **54** in the top **44**. Figure 4 illustrates this stage of the operation. In this position, the ends of the envelope **10** are clear of the tapes **12**. Next a positive blast of air from the passages **58'** in the threader base **42** causes the central portions **16** of the tapes **12** to be displaced from the edge portions **18** thereby opening the loops in the tapes. This operation may again be aided by suction pressure in the passages **58** of the threader top **44**. Figure 5 illustrates this stage. Next, positive air pressure from the passages **54** in the threader will force the envelope **10** to its original flat position thereby inserting the ends of the envelope in the opened loops. The air pressures holding the loops open will then be released. Now the envelope assembly is complete as illustrated in Figure 6 and it will be pulled through by the tension rollers **36** and **38** so that the next envelope may be inserted. The hopper **40** is so arranged under the tension roller **36** that the series aligned envelopes will automatically stack themselves.



While the invention has been shown and described as comprising apparatus for inserting envelopes in a pair of tapes, it will be understood that a single tape may be used to accomplish the same result. Moreover, although the invention has been described with reference to envelopes, it should be apparent that it is equally suitable for other items of stationery. Hence, wherever the term "envelope" is used in this description and in the appended claims, it will be understood that this term is also intended to embrace such items as postcards, index cards, and the like.

What is claimed is:

1. An envelope threader for assembling individual envelopes to a continuous tape having intermittent loops therein comprising means for supporting a portion of a tape, means for positioning an envelope on said tape portion, means for drawing the envelope away from the tape, means for opening a loop in the tape, and means for moving the envelope toward the tape so that a portion thereof may be inserted in the loop.

2. An envelope threader for assembling individual envelopes to a continuous tape having intermittent loops formed therein, said threader comprising means defining a chamber having an arched roof, means in said chamber for drawing an envelope to the top of said chamber away from the tape, means for opening a loop in the tape, and means for forcing an envelope toward said tape so that a portion thereof is inserted in said loop.

3. An envelope threader for assembling individual envelopes to a continuous tape having intermittent loops formed therein comprising means defining a substantially enclosed chamber having an arched roof, means for guiding said tape through said chamber, air pressure means for moving said envelope to the roof of said chamber away from said tapes, air pressure means for opening the loops in said tapes, and air pressure means for forcing said envelope to the bottom of said chamber so that a portion thereof is inserted into the loop of said tape.

4. Envelope threading apparatus for assembling individual envelopes to a continuous tape having intermittent loops formed therein, comprising means defining a substantially enclosed chamber having an arched upper surface, means for passing the tape through said chamber, means for introducing individual envelopes into the bottom of said chamber, air pressure means for forcing an envelope to the top of said arched chamber, air pressure means to open a loop of the tape, and air pressure means to return the envelope to its original position in which the end thereof will be inserted in the loop.

5. Envelope threading apparatus for applying

individual envelopes to a continuous tape having loops therein adapted to hold the envelopes comprising means defining a chamber having an arched roof, mechanism for moving the tape intermittently through said chamber, means for introducing envelopes into said chamber, means for holding an envelope against the arched roof of said chamber away from the tape, means for opening a loop in said tape, and means forcing said envelope away from the roof of said chamber and into the loop in the tape.

6. Envelope threading apparatus for applying individual envelopes to a continuous tape having loops formed therein adapted to hold said



envelopes comprising a threader having an arched chamber therein, mechanism for moving the tape through the bottom of said chamber, an envelope magazine capable of feeding envelopes one at a time into said chamber, air pressure means for drawing an envelope away from the tape in said chamber, air pressure means for opening a loop in said tape, means for inserting a portion of said envelope in said loop, and a hopper for receiving the assembled envelopes and tape.

No references cited.