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Luperti

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[54] **AUTOMATIC ENVELOPE OPENER**

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[52] **U.S. Cl.** ..... **83/94,** 53/381 R, 83/435.2, 83/912, 271/2

[51] **Int. Cl.** **B26d 1/28**

[58] **Field of Search** ..... 83/912, 94, 435.2; 53/381 R; 214/305; 271/2, 89

[56] **References Cited**

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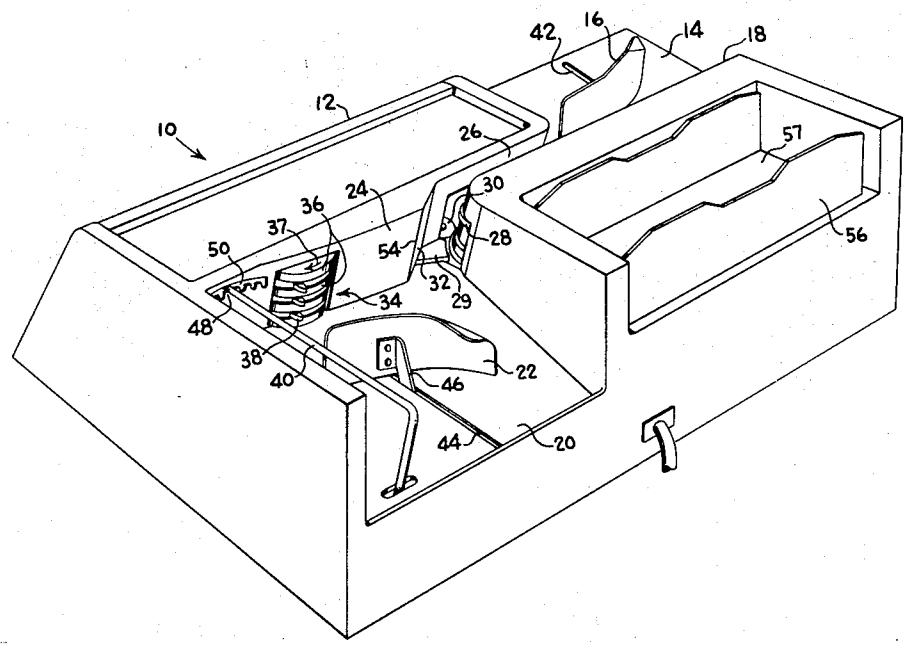
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[57] **ABSTRACT**

An automatic envelope opener is described wherein a housing having an envelope infeed platform and envelope outfeed platform enables envelopes to be automatically opened. The envelopes are retained on edge in a generally vertical orientation on the platforms and moved one at a time from the infeed platform along a travel path, where a cutter is located, to the outfeed platform for stacking. The envelopes have a small edge segment severed by a cutter horizontally operative in the travel path and are automatically stacked against a movable retainer at the outfeed platform with a stacker and a diverter wall placed in the travel path to deflect envelopes towards the retainer. An envelope jogger is mounted on the housing to urge envelope contents to one edge and enable envelope opening without damage to the contents.

12 Claims, 3 Drawing Figures



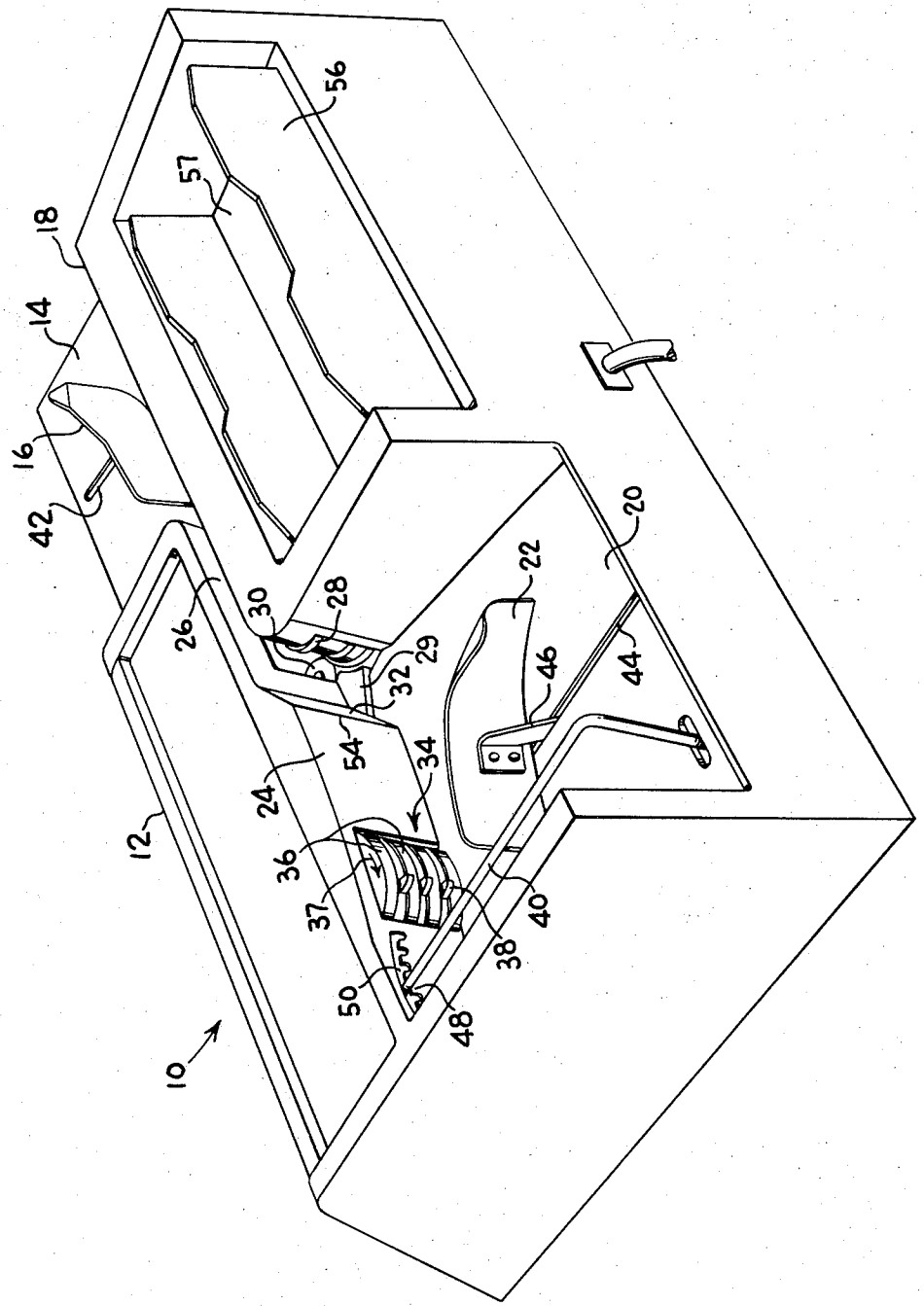
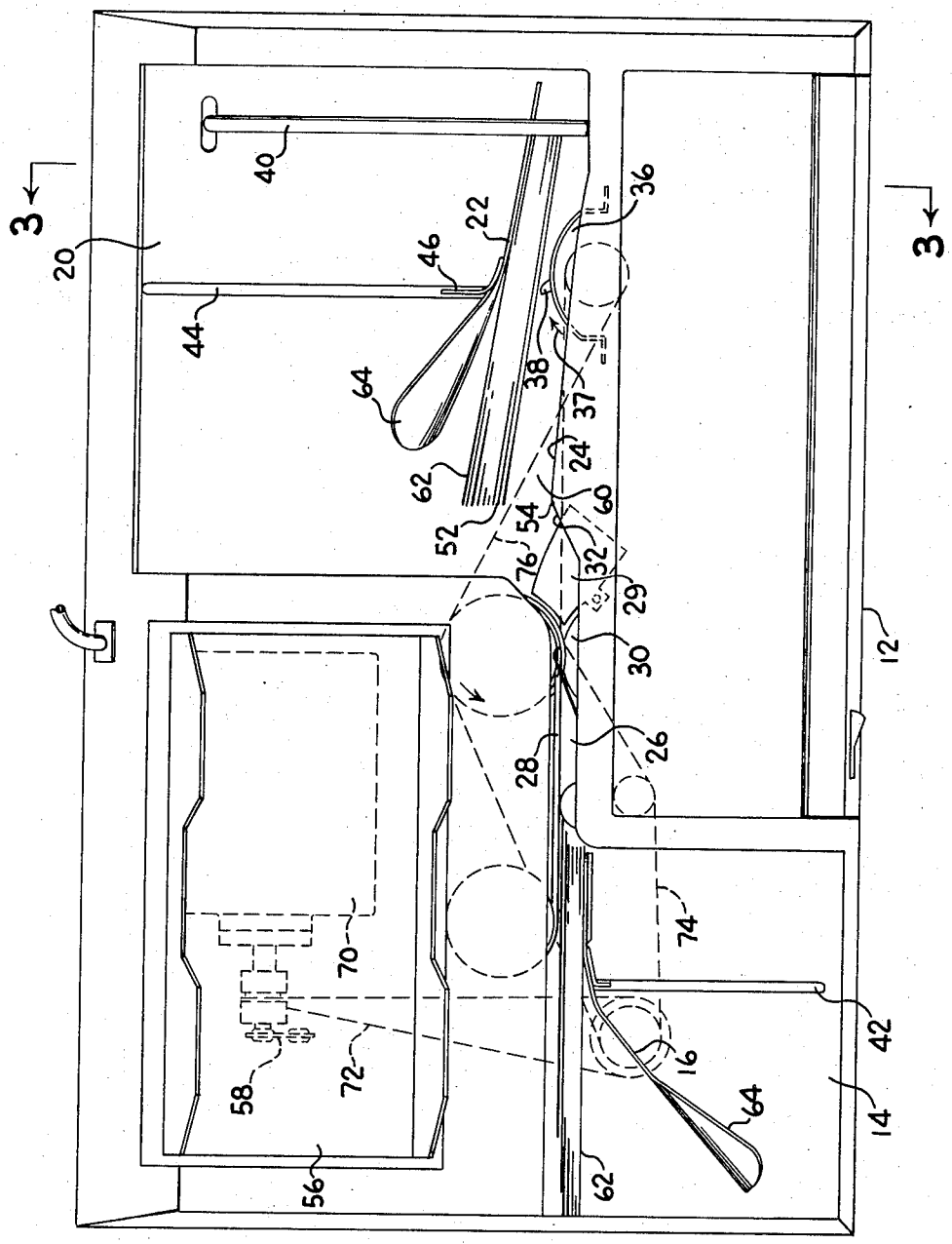

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FIG. 1

FIG. 2


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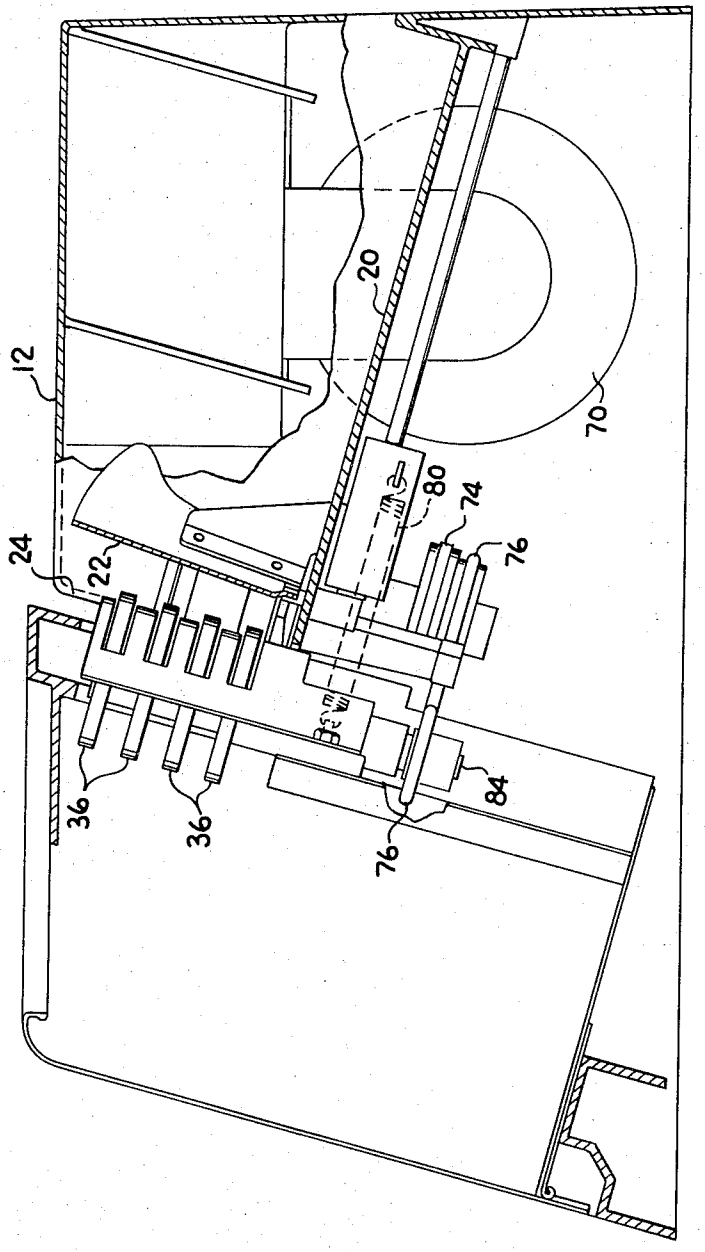


FIG. 3

AUTOMATIC ENVELOPE OPENER

FIELD OF THE INVENTION

This invention relates to an automatic envelope opener. More specifically, this invention relates to an apparatus for the automatic opening and stacking of envelopes.

BACKGROUND OF THE INVENTION

Machines for the automatic opening of envelopes have been well-known in the art. See for example the patents to Keiser U.S. Pat. Nos. 1,838,840 and 2,027,045. In the latter patent, a horizontally disposed envelope is advanced by a twisted belt towards a rotating cutter which severs a small edge segment of the envelope to open it. Another envelope opener is described in the patents to Lawrence U.S. Pat. Nos. 2,220,251 and 2,272,323 and a more recent envelope opener is described in the patent to Calhoun, et al, U.S. Pat. No. 2,635,694.

When a large number of envelopes need to be opened, a quick and efficient envelope opening is desired without problems such as an intermixture of cut chips with the opened envelopes or inadvertent damage to the contents of the envelopes.

SUMMARY OF THE INVENTION

In an automatic envelope opener in accordance with the invention, a stack of envelopes is placed on an infeed platform of a housing after their contents have been urged towards one envelope edge by a jogger device located on the housing. The envelopes are then placed on the infeed platform while resting on the edge which is opposite to the one adjacent to the envelope contents.

The envelopes are retained in a generally vertical position on the infeed platform from which they are advanced to an outfeed platform along a travel path by a belt. The envelopes' bottom edges are urged against a pair of generally horizontally oriented rotating cutter elements which are so located to sever the bottom envelope edges to open the envelopes. The outfeed platform of the envelope opener is provided with a stacker with which the opened envelopes are stacked.

An advantage of the envelope opener resides in its ability to open envelopes in a quick manner without damage to or loss of the contents. A variety of different envelope sizes may be accommodated while maintaining a stacking capability in an automatic manner.

It is, therefore, an object of the invention to provide an automatic envelope opener whereby each envelope may be conveniently opened and a large number can be quickly processed in an efficient and accurate manner without destruction of envelopes' contents while accommodating a large number of different envelope sizes.

BRIEF DESCRIPTION OF DRAWINGS

These and other advantages and objects of an envelope opener in accordance with the invention will be understood from the following description of an automatic envelope opener in accordance with the invention described in conjunction with the drawings wherein

FIG. **1** is a perspective view of an envelope opener in accordance with the invention;

FIG. **2** is a horizontal plan view of an envelope opener shown in FIG. **1**; and

FIG. **3** is a section view of the envelope opener taken along the line **3—3** in FIG. **2.**

DETAILED DESCRIPTION OF EMBODIMENTS

With reference to FIG. **1,** an automatic envelope opener **10** is shown formed of a housing **12** having an envelope infeed platform **14.** An envelope retainer **16** is located on infeed platform **14** and is spring loaded towards an infeed envelope guide wall **18.**

An envelope outfeed platform **20** is provided with an envelope retainer **22** in the form of a press plate which is spring loaded towards an outfeed envelope support wall **24** to maintain opened envelopes in a stacked and generally vertical orientation on outfeed platform **20.** The infeed and outfeed platforms **14, 20** are shown connected by a generally narrow envelope travel path **26** along which envelopes are moved by a twisted belt **28,** a portion of which may be seen in the view of FIG. **1.**

Envelopes retained on the infeed platform are advanced by belt **28** past a pair of generally horizontally oriented cutter wheels **30** (only one of which is visible in the view of FIG. **1**) which sever the bottom edges of the envelopes. As the envelopes are moved along travel path **26** they encounter a deflection wall **32** which deflects envelopes towards retainer **22** and an envelope stacker **34.** The envelope stacker **34** is formed of a plurality of wheels **36,** rotating in the direction of arrow **37,** and having protrusions **38** with which each opened envelope is urged by repetetive impacts against an adjustable stop or stacking fence **40.** In this manner opened envelopes, as they arrive, are maintained with their leading edges against stop **40** to stack sequentially until all envelopes at the infeed platform have been opened. Stacking wheels **36** are preferably formed of a molded urethane material.

The infeed platform **14** is inclined downwardly towards wall **18** and has a slot **42** to enable a bracket (not shown) to support retainer from below platform **14.** Outfeed platform **20** is inclined downwardly away from wall **24** and provided with a slot **44** through which retainer **22** can be movably supported with a bracket **46.** The spring loading of retainers **16, 22** is obtained with suitable springs mounted below platforms **14, 20** respectively. Stop **40** is adjustable between discrete locations with projections **48** in a slot **50** in wall **24.** Stop **40** is so located that the trailing edges **52,** see FIG. **2,** of opened envelopes protrude either past the junction **54** of wall **24** and diverter wall **32** or have a desired spacing from diverter wall **32** to enable subsequent envelopes to be conveniently stacked.

An envelope jogger **56** is provided with which the contents of an envelope may be urged against one edge or side within the envelope. The envelopes are placed in a general vertical orientation on an platform **57** which is vertically vibrated by an eccentric motor drive **58** located below platform **56** to bounce envelopes up and down and thus urge their contents to move downwardly towards the bottom edge.

After completion of the jogging, contents of the envelopes have been moved adjacent the envelope bottom edge. Those jogged envelopes then are placed on infeed platform **14** but with the edges which are opposite from the one where the contents are adjacent to, facing down. Cutting wheels **30,** which may be formed

in a manner as shown in U.S. Pat. No. 2,027,045, sever a narrow strip of material from the bottom edge of an envelope as the envelopes on infeed platform **14** are fed by belt **28** along path **26.** The envelope chips cut by wheels **30** are passed below a chip diverter plate **29** into a suitable waste container mounted below and to the front of outfeed platform **20.**

As shown in FIG. **2,** outfeed platform **20** is provided with an envelope retainer **22** which is angled relative to the envelope travel path **26** to form a wide opening **60** for opened envelopes **62** to enter and pass on to stop **40.** Both retainers **16** and **22** are provided with lips **64** for manual control. The rotational drive for belt **28,** cutter wheels **30** and stacker wheels **36** is obtained from a motor **70** and drive belts such as **72, 74** and **76** located below infeed and outfeed platforms **14, 20.** The stacking wall **24** is shown to recede away from retainer **22** commencing at the intersection **54** with diverter wall **32.**

With reference to FIG. **3,** a cross-sectional view of outfeed platform **20** is shown. Envelope outfeed platform **20** is inclined downwardly from wall **24** to facilitate movement of envelope retainer **22** as opened envelopes are stacked by stacking wheels **36.** Retainer **22** is held in place with a spring **80** oriented parallel with platform **20.** Drive belt **76** engages a pulley **82** which is coaxially mounted with stacker wheels **36** on a shaft **84.**

Having thus described an automatic envelope opener in accordance with the invention, its advantages may be appreciated. The envelope stacker conveniently retains opened envelopes against the stop while the inclination of outfeed platform facilitates the stacking. The protrusions on stacker wheels enable frequent impacting stacking contact with the opened envelope without a continuous rubbing action which would leave undesirable visible markings.

What is claimed is:

1. An apparatus for automatically opening envelopes comprising

an envelope opening housing having an envelope infeed platform and an envelope outfeed platform;

the envelope infeed platform being provided with means for retaining envelopes in a stack with each envelope being oriented on an edge in a generally vertical position on the infeed platform;

the envelope outfeed platform being provided with means for retaining opened envelopes in stack relationship with generally the same envelope orientation as on the infeed platform;

means defining a generally narrow envelope travel path interconnecting said infeed and outfeed envelope platforms;

envelope cutting means having a pair of generally horizontally rotating cutting wheels located to sever a segment of the envelope edges resting on the infeed platform to open the envelopes; and

means for driving the envelopes from the infeed platform along the envelope travel path towards the cutting wheels for opening thereof along said edges.

2. The apparatus for automatic opening of envelopes as claimed in claim **1** wherein the outfeed platform is further provided with

an upright envelope support wall located in general alignment with the envelope travel path;

an envelope support oriented to receive and retain opened envelopes arriving along the travel path, the envelope support being spring loaded towards the envelope support wall to capture opened envelopes therebetween and retain the envelopes in a generally vertical orientation.

3. The apparatus for automatic opening of envelopes as claimed in claim **2** wherein the outfeed platform envelope support wall is provided with a deflecting wall segment facing the opened envelopes arriving along the travel path;

an adjustable envelope stop located for positioning arriving envelopes to protrude past the deflecting wall segment and enable arriving envelopes to be stacked on edge against the envelope support.

4. The apparatus for automatic opening of envelopes as claimed in claim **3** wherein the outfeed platform envelope support wall is provided with means for urging arriving envelopes against the envelope edge locator.

5. The apparatus for automatic opening of envelopes as claimed in claim **4** wherein the urging means includes a plurality of axially aligned rotatably mounted drive wheels, each wheel having a radial protrusion extending past the envelope support wall for contact with opened envelopes located on the outfeed platform; and

means for rotating the drive wheels in a direction selected to seat arriving opened envelopes against the envelope stop.

6. The apparatus for automatic opening of envelopes as claimed in claim **5** wherein the infeed platform is inclined towards the travel path and wherein the outfeed platform is downwardly inclined away from the travel path.

7. The apparatus for automatic opening of envelopes as claimed in claim **6** and further including

a vertically movable horizontal envelope supporting platform, and means for vertically vibrating the envelope platform at a frequency selected to jog envelope contents towards the edge of the envelopes resting on the envelope platform.

8. An apparatus for automatic opening of envelopes comprising

a housing having an envelope infeed platform terminating at a generally vertically oriented envelope support wall and an envelope outfeed platform commencing at a generally vertically oriented stacking wall;

means defining a generally narrow envelope travel path interconnecting the infeed platform with the outfeed platform and being shaped to maintain envelopes traveling therealong on a bottom edge;

means for advancing envelopes from the infeed platform to the outfeed platform;

means located along the travel path for cutting the bottom edge of the envelopes to open said envelopes; and

a movable envelope retainer located on the outfeed platform and being oriented to enable opened envelopes to be stacked on edge between said stacking wall and said retainer.

9. The automatic envelope opener as claimed in claim **8** wherein the outfeed platform is further provided with an envelope stacker mounted between the retainer and the stacking wall to urge arriving opened envelopes in a desired direction for stacking.

10. The automatic envelope opener as claimed in claim 9 wherein the outfeed platform is further provided with an adjustable envelope stop located to receive and align the front edge of opened envelopes thereby positioning the trailing edge of said envelopes to provide a clear path of travel for the next envelope to be received.

11. The automatic envelope opener as claimed in claim 9 wherein the envelope stacker is formed of a plurality of stacking wheels having protrusion for impacting contact with opened envelopes and means for rotating the stacking wheels.

12. The automatic envelope opener as claimed in claim 8 wherein the housing is further provided with a movable envelope support plate, and means for vertically vibrating envelopes placed on the support plate to jog envelope contents against one side of the envelopes.

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