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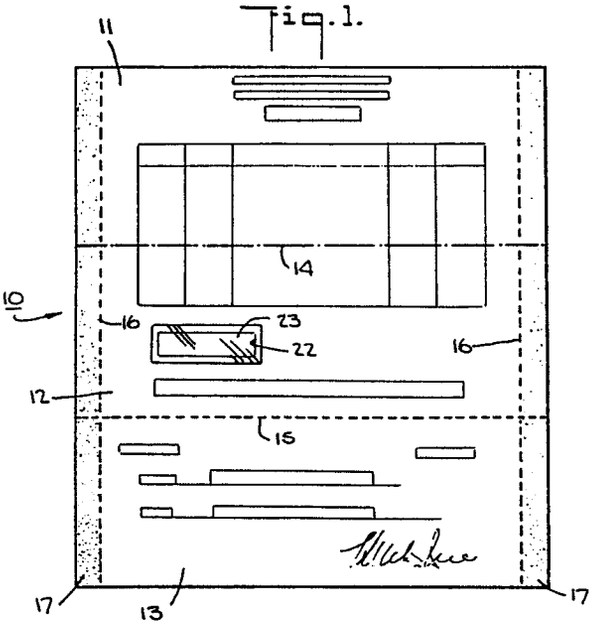
(54) One-piece mailer and apparatus for folding same.

(57) A one-piece mailer is produced from a one-piece blank produced as such or which is part of an assembly of interconnected one-piece blanks, the one-piece blank having at least two contiguous sections disposed for folding over on each other into overlying relation, each section having remoistenable glue along the respective longitudinal edges for bonding the sections together. Optionally glue is also disposed near a transverse edge of one of the sections. An apparatus is described for folding and sealing such blank comprising feed means, means for applying water to at least one side of the blank being conveyed along each longitudinal edge and means for folding the sections of a conveyed blank into overlying relation while pressing the opposed longitudinal edges together to permit the activated glue to bond the edges together.

Fig.1.



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ONE-PIECE MAILER AND APPARATUS FOR FOLDING SAME

This invention relates to a one piece mailer and to an apparatus for folding a one-piece mailer. More particularly, this invention relates to a one-piece mailer, an assembly of one-piece mailers and an apparatus for folding and sealing a one-piece mailer.

Heretofore, various types of one-piece constructions have been known for the fabrication of a mailer. For example, U.S. Patent 4,055,294 describes a continuous web from which a series of connected one-piece assemblies are constructed. In this case, various lines of perforations are provided in the web so that the web may be folded about a longitudinal score line so that one portion overlies another portion of the web in order to define return envelope pockets therebetween. Other lines of perforations are also provided to permit the remaining web portion to be folded over the previously folded portions to form a series of three-ply mailers. In this construction, use is made of a previously applied hot-melt adhesive in order to secure the folded over portions together.

Other types of assemblies have also been known wherein various plies of a mailer are folded over on each other and secured in place by an adhesive. However, these adhesives tend to be hot melt adhesives or other heat activated adhesives.

In the case where users process streams of mailers, for example of the interconnected type, through laser printers, a difficulty arises in the subsequent folding and sealing of the mailers into a condition suitable for mailing. Specifically, the folding equipment requires some form of heater in order to activate the hot melt glues so as to form a sealed envelope. Such constructions tend to be relatively costly.

Accordingly, it is an object of the invention to provide a one-piece mailer of simple construction which can be readily folded and sealed in a simple, economical manner.

It is another object of the invention to provide a simple and economic apparatus for the folding and sealing of one-piece mailers.

Briefly, the invention provides a one piece mailer blank having contiguous sections disposed for folding over on each other and wherein each section has a pair of remoistenable glue strips along the respective longitudinal edges for bonding the facing sections together when folded. The mailer may be constructed with two or three foldable sections. In addition, the mailer blank may be provided with one or two transverse fold lines to permit subsequent folding of a blank into a two-ply mailer or three-ply mailer.

The one-piece mailer may also have remoistenable glue disposed near a transverse edge for bonding to the other sections. Whether the mailer is a two-ply or three-ply mailer, this glue serves to seal the mailer transversely across the mailer without leaving a gap which might be inadvertently opened.

The invention also provides a mailer assembly having a plurality of interconnected one-piece mailer blanks which are separated from each other by transverse burstable lines of weakening. In this respect, the mailer assembly is of one-ply construction and is provided with removable strips of control holes along the longitudinal edges to facilitate feeding through various types of automatic machinery, for example, a laser printer.

After the mailer assembly has been processed, for example, through a laser printer which provides the mailer with information, such as an address of a recipient, address of a sender and other information, each mailer blank is separated from the assembly, if continuous, by bursting along a transverse line of weakening. Thereafter, water is applied to the edges of each mailer to activate the glue strips and the blank is folded with the folded over sections being pressed together in order to effect a bonding of the sections together via the water-activated glue strips.

When the blanks also have glue along a transverse edge, this glue is also activated by the application of water along the transverse edge prior to folding of the blank. When the blank is folded, the remoistened glue effects a bonding of the transverse edge to a facing mailer section.

The invention also provides an apparatus for folding and sealing the mailer blanks into mailers. This apparatus includes a feed means for receiving and conveying a one-piece mailer blank with remoistenable glue strips thereon, means for applying water to at least one side of the conveyed mailer blank along each longitudinal edge in order to activate the glue means for folding the sections of the mailer blank into overlying relation while pressing the opposed longitudinal edges together in order to permit the activated glue strips to bond the edges together and form a sealed unit.

The folding apparatus may be of generally conventional structure modified to have a means for applying water to the edge areas of the conveyed mailer blanks. In this regard, the means for applying the water may include a water reservoir disposed below the conveyed mailer blanks and an applicator, such as a rotatably mounted wheel or capillary brush, for transferring water from the reservoir to the underside of a conveyed blank. Alternatively, the means for applying the water may

include a water reservoir and a nozzle which communicates with the reservoir and is directed towards a conveyed blank for transferring water to the conveyed blank by pressure or by gravity.

Where the blanks are provided with glue along a transverse edge, the folding apparatus also includes a similar means for applying water to the conveyed blanks along the transverse edge.

These and other objects and advantages of the invention will become more apparent from the following detailed description taken in conjunction with the accompany drawings wherein:

Fig. 1 illustrates a plan view of a one-piece mailer blank constructed in accordance with the invention;

Fig. 2 illustrates the position of the blank of Fig. 1 as conveyed within a folding machine in accordance with the invention;

Fig. 3 illustrates a perspective view of the manner in which the blank of Fig. 1 is folded in the folding machine in accordance with the invention;

Fig. 4 illustrates a perspective view of a one piece mailer in accordance with the invention;

Fig. 5 illustrates a view of a continuous mailer assembly in accordance with the invention;

Fig. 6 illustrates a folding machine incorporating a plurality of water applicators in accordance with the invention;

Fig. 7 illustrates a modified means for applying water to the underside of a one-piece mailer blank in accordance with the invention;

Fig. 8 illustrates a further modified means for applying water to a conveyed mailer blank;

Fig. 9 illustrates a modified means for applying water to a mailer which operates under gravity;

Fig. 10 illustrates a modified folding machine for activating glue on a transverse edge of a blank;

Fig. 11 illustrates a view of a mailer blank having remoistenable glue spots at a transverse edge; and

Fig. 12 illustrates a view of a mailer blank having a shaped flap with remoistenable glue.

Referring to Fig. 1, the one-piece mailer is formed from a flat blank 10 of rectangular shape which is divided into three longitudinally disposed contiguous sections 11, 12, 13 by transverse fold lines 14, 15, a pair of longitudinal perforations 16, or other like lines of weakening extended along the blank 10 approximately one-half (1/2) inch from the respective longitudinal edges. Each section 11, 12, 13 is also provided with a pair of remoistenable glue strips 17 along and between each respective longitudinal edge and a perforation 16. For example, each glue strip is 1/2 inch wide for a blank having a width of 8 1/2 inches. The remoistenable glue is made of any suitable glue which can be reactivated with water such as a vinyl copolymer dispersion adhesive.

Referring to Fig. 5, the mailer assembly 18 is formed of a plurality of interconnected one-piece mailer blanks 10 which are separated by transverse burstable lines of weakening 19. In addition, the assembly 18 includes longitudinal strips 20 which are provided with control holes 21, for example for feeding through a laser printer for the application of information to the various mailer blanks 10.

As indicated in Fig. 1, each mailer blank 10 can be imprinted with information such that the upper two sections 11, 12, as viewed, form a voucher including the address of a recipient while the lower section 13 is printed as a check. In this case, the lower fold line 15 is made as a line of weakening, e.g., a perforation, to permit the section 13 to be subsequently separated from the section 12. In addition, the backside of the mailer blank 10 may be provided with information, such as the return address of a sender, for example in one corner of the middle section 12. In addition, the middle section 12 may be provided with a cut-out 22 and an overlying plastic film 23 to permit viewing of a printed address of the recipient on one section 13. After feeding the mailer assembly 18 through the printer, the longitudinal strips 20 may be removed and, thereafter, the individual mailer blanks 10 can be separated from the assembly 18 by bursting across the lines of weakening 19.

After being burst from the mailer assembly 18, each mailer blank 10 can be delivered to a folding and sealing machine or apparatus 24. In this regard, as indicated in Fig. 6, the machine 24 includes a tray 25 for receiving a stack of mailer blanks 10, means 26 for applying water to at least one side of the blank 10 along each longitudinal edge in order to activate the glue and means (not shown) for folding the sections 11, 12, 13 into overlying relation while pressing the opposed or facing longitudinal edges together to permit the activated glue strips 17 to bond the edges together.

The machine 24 is of conventional structure and need not be further described. For example, in the case of a machine sold by A. B. Dick as a Desk Top Folding Machine, Model 52, a feed means 27 in the form of a friction feed roller (Fig. 2) is provided to individually convey the blanks 10 from the tray 25.

The means 26 for applying water includes a pair of water reservoirs 28 each of which is mounted on the machine 24, a plastic tube 29 for delivering water from the reservoir 28 and an applicator 30 for transferring water from the respective reservoir 28 via the tube 29 to the edge of the conveyed blank 10. In this regard, as indicated in Fig. 2, each blank 10 is conveyed with the glue side facing the respective applicator 30.

Referring to Fig. 2, each water applicator 30 is

in the form of a rotatably mounted wheel 31 which is capable of picking up water from a reservoir 32 for application to the underside of the blank 10.

Alternatively, as shown in Fig. 7, the applicator may be a brush 33 which extends upwardly from the reservoir 32 for wetting the conveyed blank 9 by capillary action.

As indicated in Fig. 8, the water applicator may be in the form of a nozzle 34 which communicates with the reservoir 32 so as to spray water onto the blank 10. Still further, as indicated in Fig. 9, the reservoir 32 may be disposed above the plane of the blank 10 so that water is fed by gravity through the nozzle 34.

Referring to Fig. 3, the means for folding the sections 11, 12, 13 of the blank 10 is of conventional structure which employs folding plates which function to fold the blanks 10 on each other to form a three-ply mailer 35, for example, as shown in Fig. 4. The mailer 35 can then be mailed in a conventional manner.

As indicated in Fig. 3, once the glue strips 17 have been activated by the application of water, the check forming section 13 is folded up against the middle section 12 with the respective glue strips in facing relation to each other. Thereafter, the remaining section 11 can be folded up so that the glue strips 17 thereon face an unglued surface of the section 13. During pressing of the sections together along the edges, the glue serves to bond the sections together into a sealed unit at the ends of the mailer 34.

Of note, depending on the folding machine, the water applicators may be positioned to apply water to the downside of a blank as in Fig. 2 or the upside of a blank. In either case, the glue strips would be in facing relation to the applicators.

Referring to Fig. 4, when a recipient receives the mailer 35, both edges may be torn off along the overlying perforations 16 so as to permit the remainder to be opened flat. The lower section 13 can then be removed along the perforations 15 where made as a check.

Referring to Fig. 11, wherein like reference characters indicate like parts as above, the mailer blank 10 may also be provided with remoistenable glue in the form of a cross-web array of glue dots 17′ disposed near a transverse edge, i.e. the 'top edge as viewed, of the upper section 11. These glue dots 17′ are made of the same glue as the glue strips 17. Alternatively, the dots 17′ may be replaced by blocks or a line of glues.

Referring to Fig. 10, the machines 24 may also include means 26′ for applying water to the blank 10 along a transverse top edge, as viewed, in order to activate the glue dots 17′ which may be present as shown in Fig. 11. In this case, the water applying means 26′ includes a reservoir 28′ which is mounted at the upper end of a tray 35 for the folding means (not shown).

As above, a plastic tube 29′ extends from the reservoir 28′ to an applicator (not shown) positioned under and in line with holes 36 in the tray 35 in order to transfer water to the leading transverse edge of a conveyed blank 10 on which the glue dots 17′ are disposed. As indicated, suitable stops 37 are provided to stop movement of the blanks from the tray 35.

After a blank 10 has been moistened along two longitudinal edges and the one transverse edge, the sections 11, 12, 13 are folded and pressed, as above, with the remoistenable glue dots 17′ of the top section 11 facing and bonding to the unglued surface of the check forming section 13. A completely sealed unit is then obtained, i.e. a unit which is sealed at the sides as well as across the top (or bottom as the case may be).

Referring to Fig. 12, the one-piece mailer 38 may be provided with lines 39 of remoistenable glue rather than stripes of glue as illustrated in Fig. 1. Further, a transverse line 40 of glue may also be provided at the upper edge.

As indicated in Fig. 12, the mailer blank 38 may also be shaped in a manner so that the lower two sections 41, 42 form the front and back of a return mailer while the uppermost section 43 forms a flap for closing the return mailer. In this case, the lower sections 41, 42 are separated by a transverse fold line 44 while the flap 43 is separated from the section 42 by a similar transverse fold line 45.

The flap 43 may be shaped as illustrated so as to have two shouldered portions 46 above the fold line 45 and a contoured closing portion 47 containing the transverse line 40 of glue.

The mailer 38 may be folded in a similar manner to the mailers described above with respect to Fig. 10. In this case, each mailer 38 is moistened along the longitudinal edges as well as along the upper edge to activate the remoistenable lines 39, 40 of glue. During folding, the lower two sections 41, 42 are folded together about the fold line 44 while the flap section 43 is folded down over the back of the lower section 41 to form a closed mailer which can then be mailed in the usual manner. One advantage of this construction is that the resulting mailer has the appearances of a conventional envelope.

As an alternative, the individual mailers may be "chopped" from a continuous web of paper so that the contour of the upper edge forming the flap section 43 is cut at the same time as the lower edge is being cut. In this way, not only is the flap section formed with a contour shape, but also the lower edge is formed with a recessed portion of mating shape. Thus, when the mailer is subse-

quently opened by means of the flap being peeled back or otherwise removed, the recess provides access into the pocket formed by the remaining two sections of the mailer.

The invention thus provides a relatively simple apparatus for the folding and sealing of one piece blanks into a mailer construction. Further, since the apparatus requires a rather inexpensive water applicator, the overall costs of making and using such an apparatus are at a relative minimum, for example as compared with folding equipment which require heaters in order to activate a hot melt glue on a mailer blank. Still further, since a remoistenable glue can be used, the costs of fabricating the one-piece mailer can be held to a minimum.

Claims

1. A one-piece blank having at least two contiguous sections (11, 12, 13) disposed for folding over on each other into overlying relation, each said section having remoistenable glue (17) along the respective longitudinal edges for bonding said sections together.

2. A one-piece blank as set forth in claim 1 wherein each said glue is made of a vinyl copolymer dispersion adhesive.

3. A one-piece blank as set forth in claim 1 wherein said one of said sections (11) has remoistenable glue (17') disposed near a transverse edge thereof for bonding to the other section.

4. A one-piece blank having at least two contiguous sections (41, 42) disposed for folding over each other into overlying relation, each said section having remoistenable glue (39) along the respective longitudinal edges for bonding said sections together and a third section (43) defining a flap section for folding over said one of said contiguous sections, said flap section having remoistenable glue (40) along a transverse edge for bonding said flap to said one section.

5. A one-piece blank as set forth in claim 4 wherein said flap (43) has a contoured shape to form an envelope.

6. A one-piece mailer having three contiguous sections (11, 12, 13; 41, 42, 43) disposed in folded overlying relation, each said section having remoistenable glue thereon facing another of said sections and bonding said sections together, said glue being disposed along a respective longitudinal edge of at least two of said sections.

7. A one-piece mailer as set forth in claim 6 wherein each said glue is made of a vinyl copolymer dispersion adhesive.

8. A one-piece mailer as set forth in claim 6 or 7 wherein one of said sections (13; 43) has remoistenable glue (17; 40) disposed near a transverse edge bonding said one section to a facing section.

9. An assembly having a plurality of interconnected one-piece blanks (10) and a plurality of transverse burstable lines of weakening (19) separating said blanks (10) from each other, each said blank (10) including at least two longitudinally contiguous sections (11, 12, 13), a pair of longitudinal lines of weakening (16) extending said sections at respective longitudinal edges thereof, remoistenable glue (17) disposed on each section between a respective longitudinal edge and a respective line of weakening (16) of a respective section.

10. An assembly as set forth in claim 9 wherein each blank has three longitudinally contiguous sections (11, 12, 13) and a transverse fold line (15) between each pair of said sections and wherein at least two sections of each blank have a pair of longitudinal glue strips (17) thereon.

11. An assembly as set forth in claim 9 or 10 which further comprises remoistenable glue (17') disposed near a transverse edge of each blank.

12. An apparatus for folding and sealing a one-piece mailer blank, said apparatus including

feed means (27) for conveying a one-piece blank having a plurality of longitudinally contiguous sections and remoistenable glue along each longitudinal edge of each section;

means (26) for applying water to at least one side of a conveyed blank along each longitudinal edge thereof to activate the glue thereon; and

means for folding said sections of a conveyed blank into overlying relation while pressing the opposed longitudinal edges together to permit the activated glue to bond said edges together.

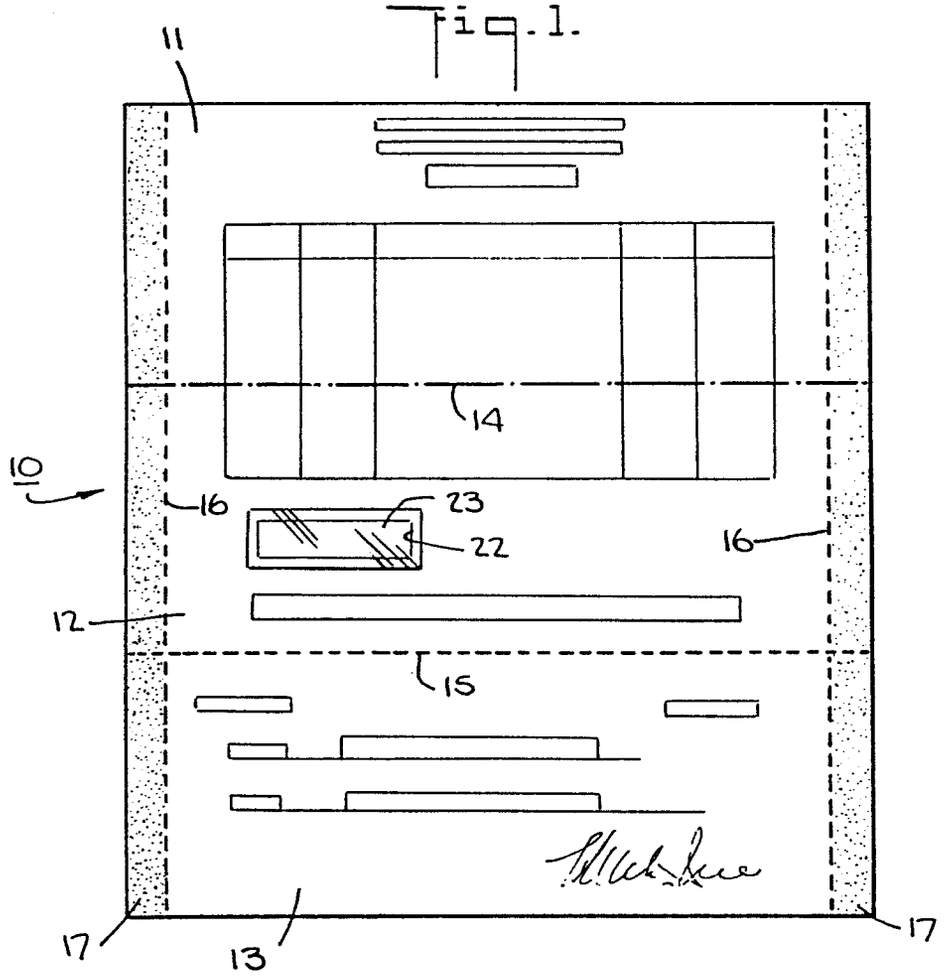
13. An apparatus as set forth in claim 12 wherein said means (26) for applying water includes a water reservoir (28) disposed adjacent a conveyed blank in said feed means (27) and an applicator (30) for transferring water from said reservoir to a conveyed blank.

14. An apparatus as set forth in claim 13 wherein said applicator is a rotatably mounted wheel (31).

15. An apparatus as set forth in claim 13 wherein said applicator is a brush (33) extending upwardly from said reservoir for wetting a conveyed blank by capillary action.

16. An apparatus as set forth in claim 12 wherein said means for applying water includes a water reservoir (28) and a nozzle (34) communicating with said reservoir and directed towards a conveyed blank in said feed means for transferring water from said reservoir to a conveyed blank.

Fig. 1.



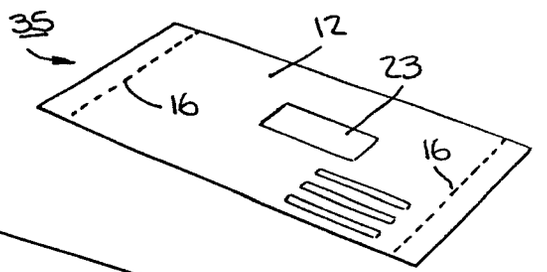
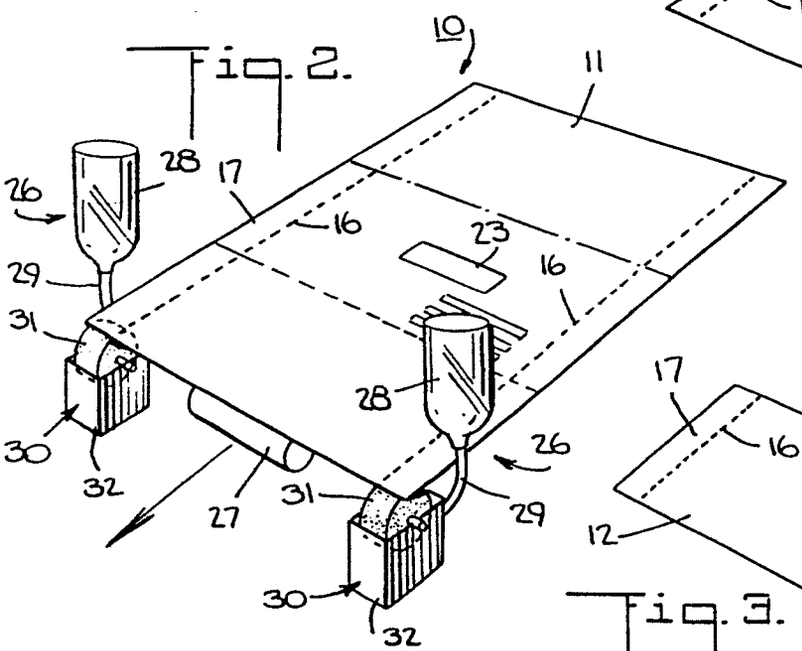


Fig. 4.

Fig. 2.



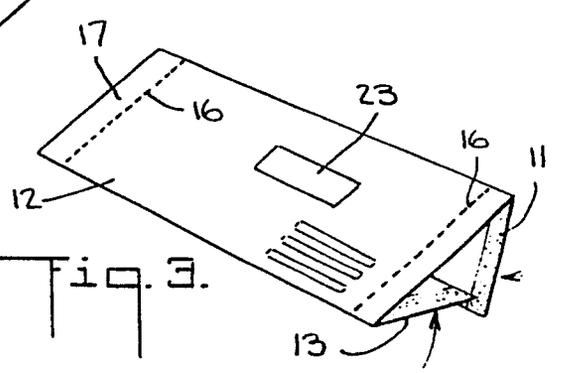


Fig. 3.

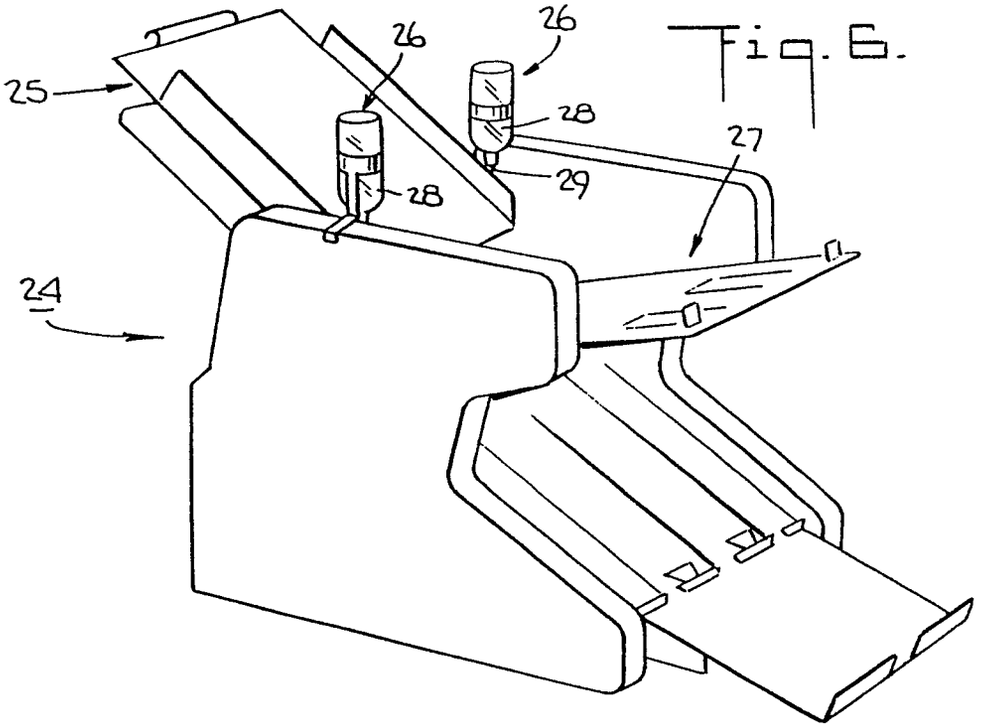


Fig. 6.

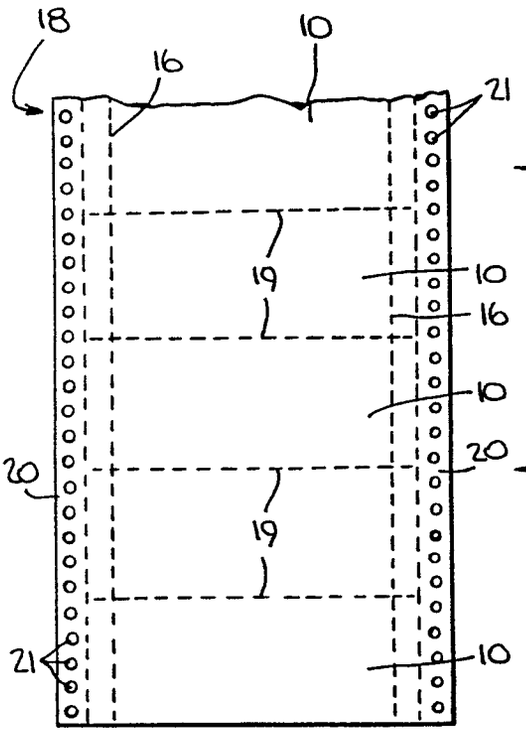


Fig. 5.

Fig. 7.

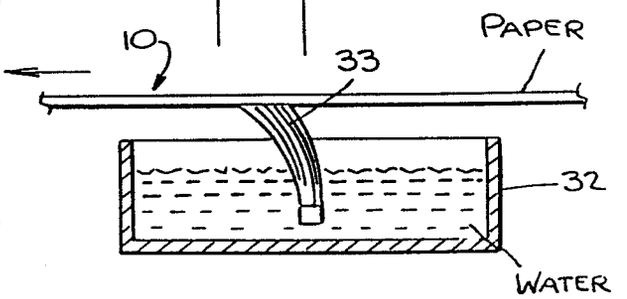


Fig. 8.

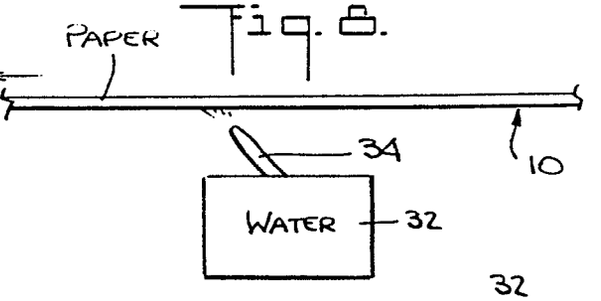
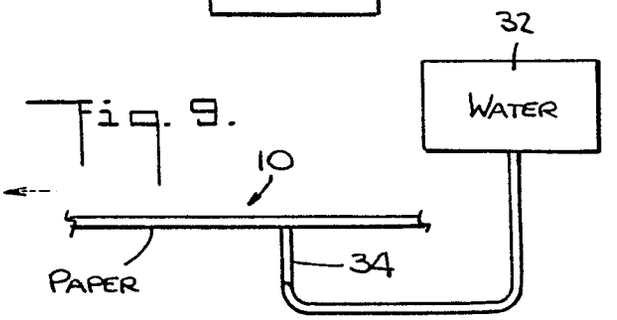


Fig. 9.



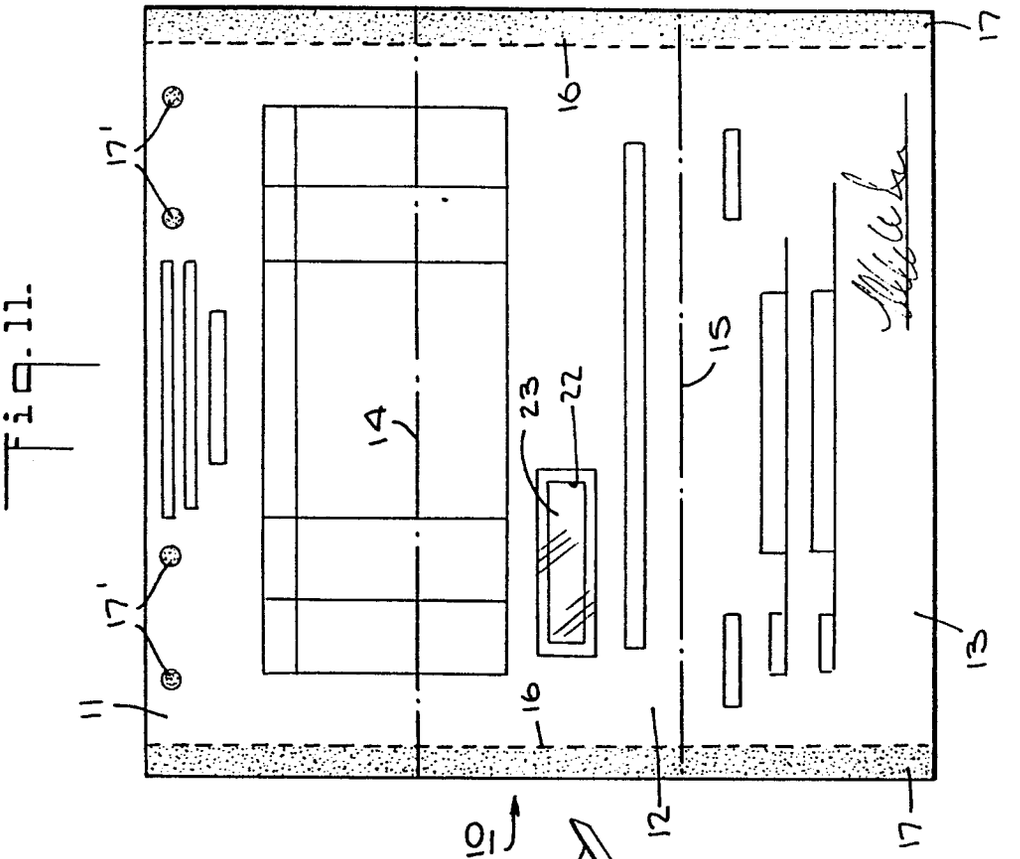


Fig. 11.

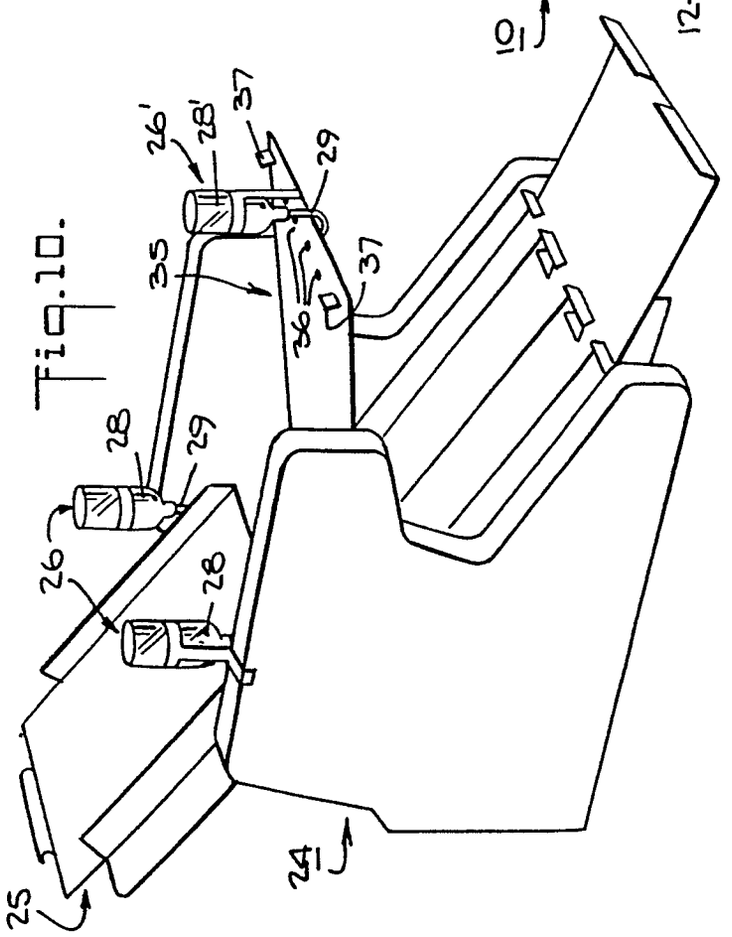


Fig. 10.

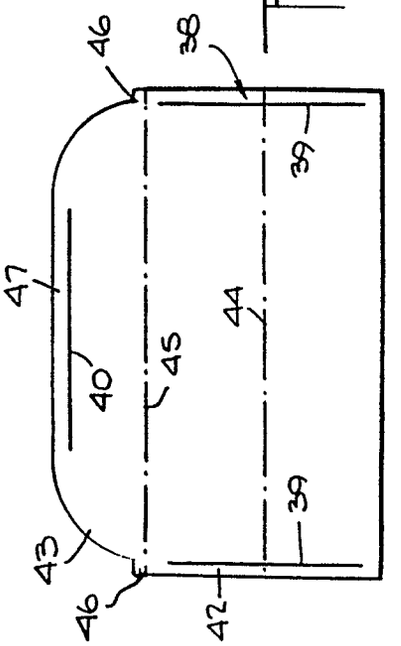


Fig. 12.