

May 14, 1968

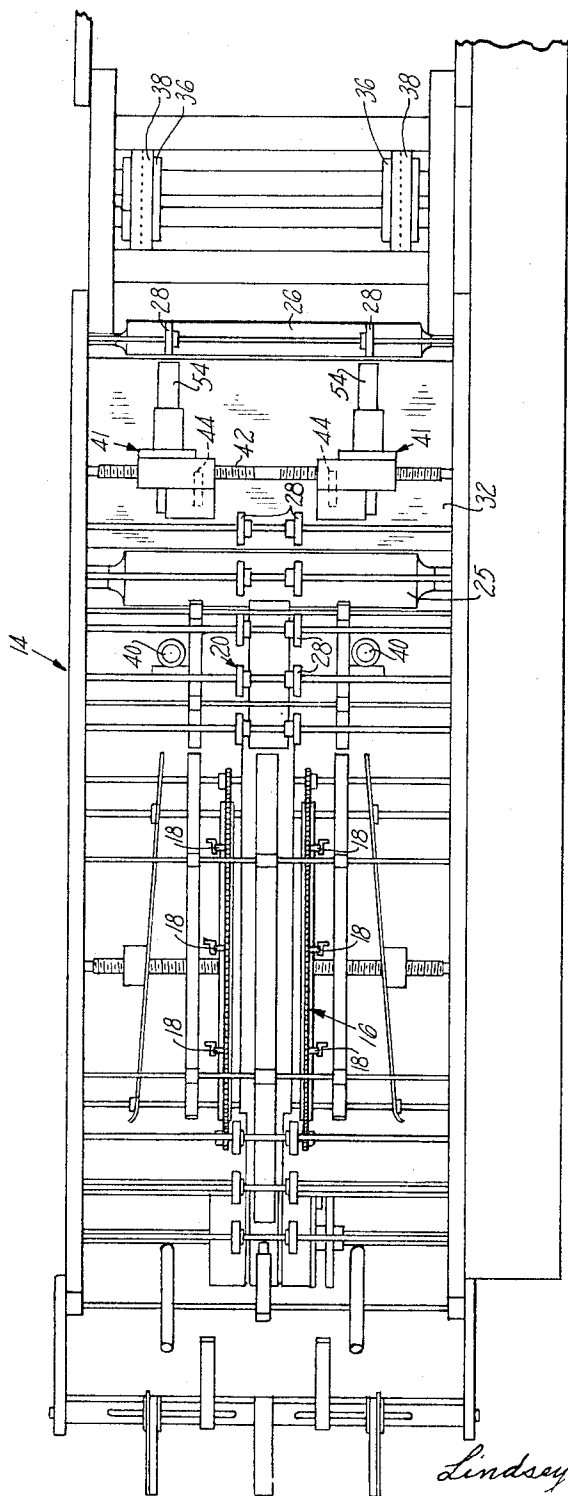
A. H. WELCH
METHOD AND APPARATUS FOR ATTACHING AND REMOVING ENVELOPES
AND THE LIKE FROM A CARRIER WEB

3,383,264

Filed March 25, 1964

6 Sheets-Sheet 1

FIG. 1



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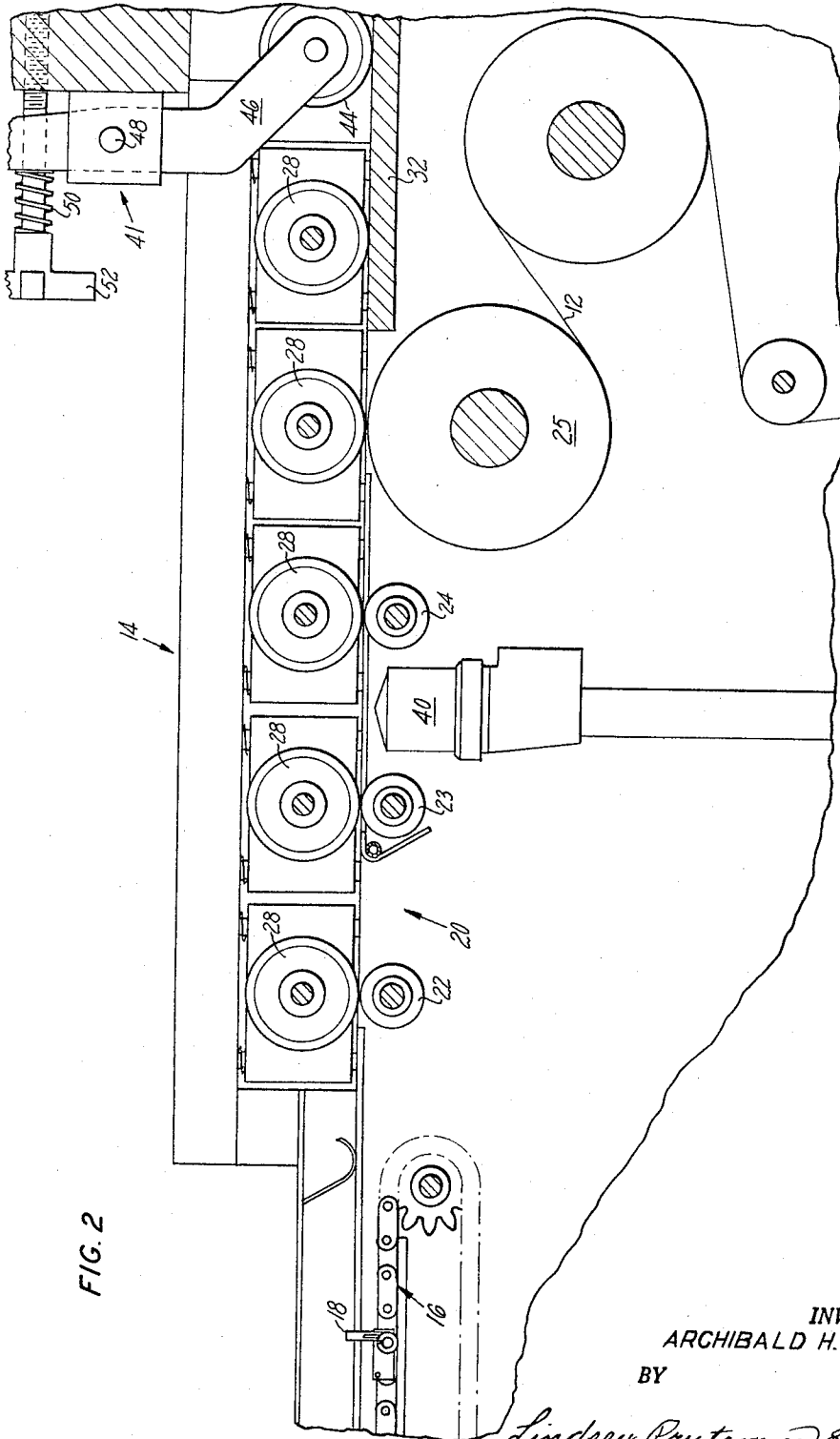
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6 Sheets-Sheet 2



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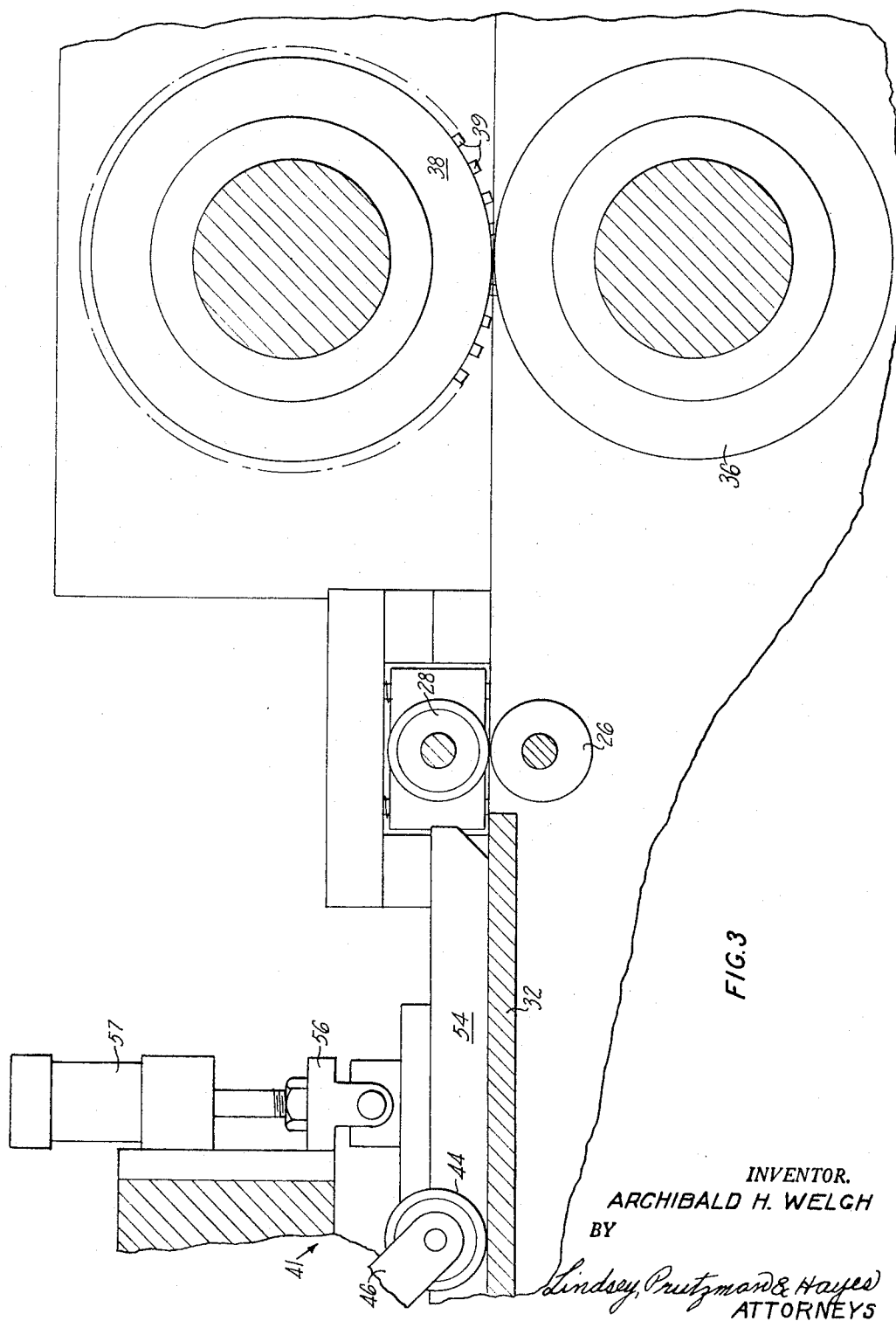
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May 14, 1968

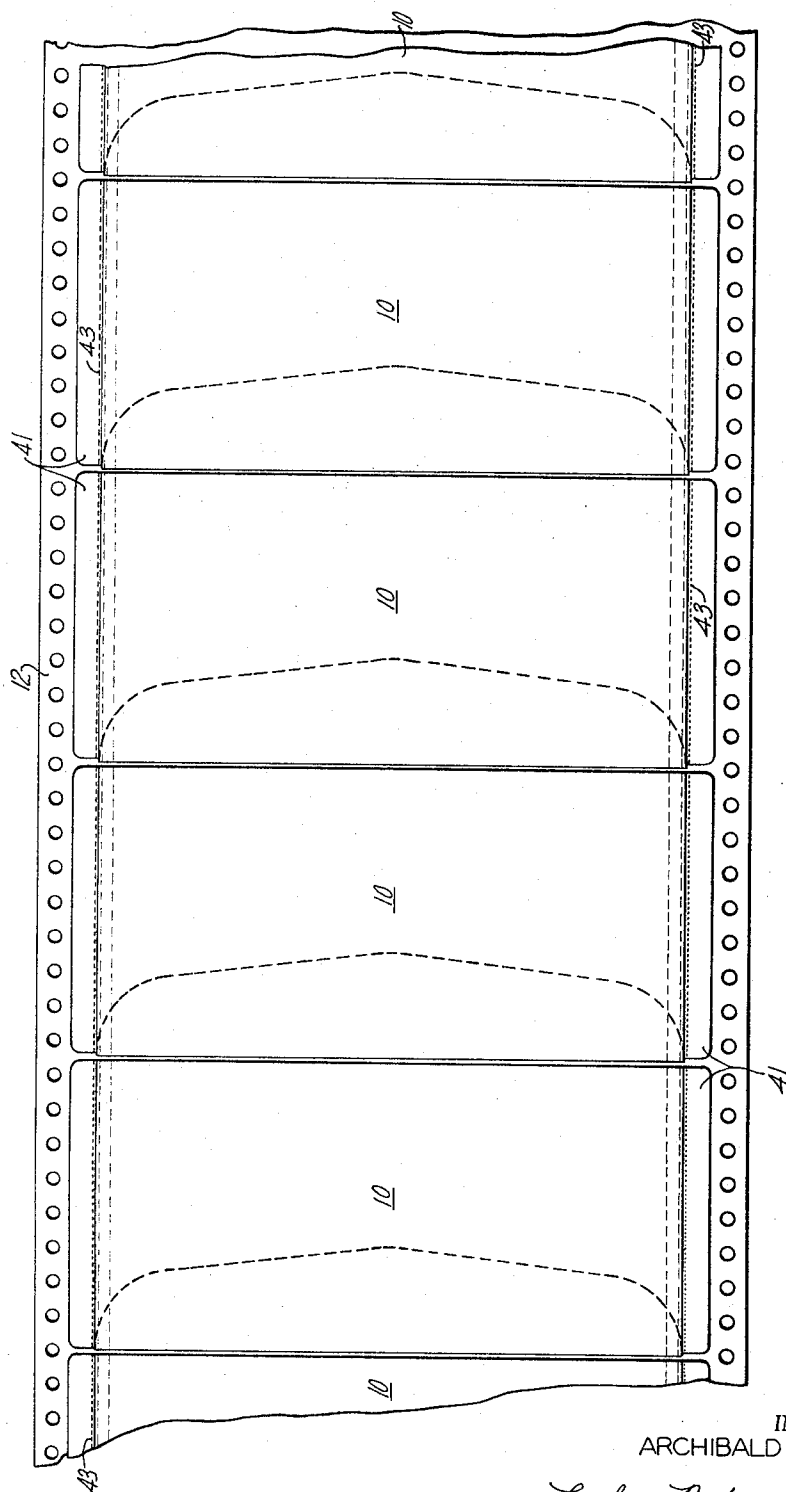
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6 Sheets-Sheet 4

FIG. 4



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May 14, 1968

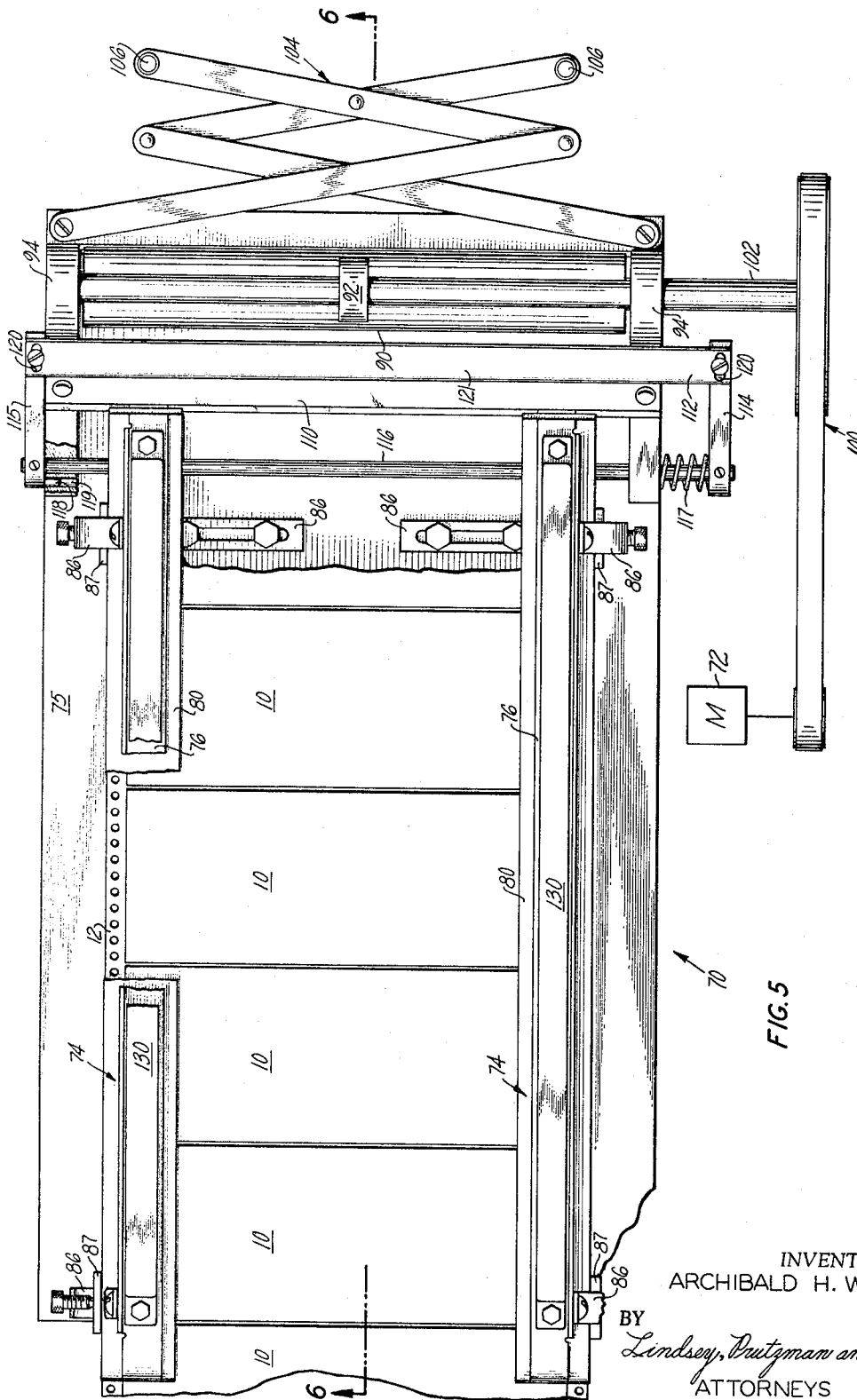
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METHOD AND APPARATUS FOR ATTACHING AND REMOVING ENVELOPES
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6 Sheets-Sheet 5



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METHOD AND APPARATUS FOR ATTACHING AND REMOVING ENVELOPES
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6 Sheets-Sheet 6

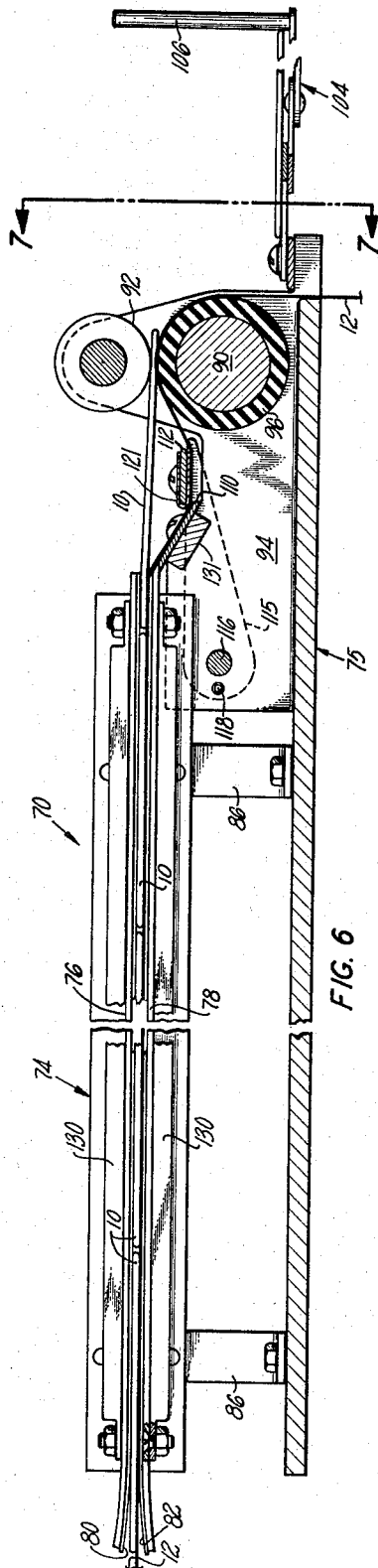


FIG. 6

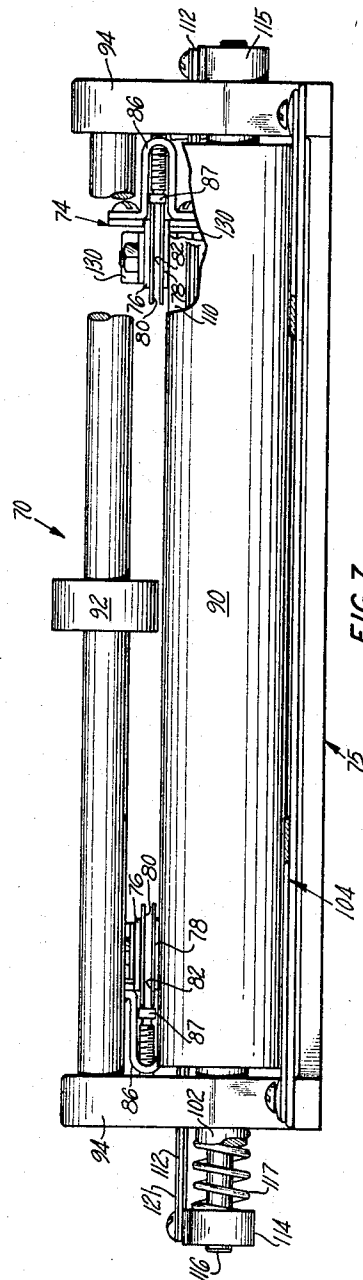


FIG. 7

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METHOD AND APPARATUS FOR ATTACHING AND REMOVING ENVELOPES AND THE LIKE FROM A CARRIER WEB

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Continuation-in-part of application Ser. No. 272,185, Apr. 8, 1963. This application Mar. 25, 1964, Ser. No. 354,645

22 Claims. (Cl. 156—247)

ABSTRACT OF THE DISCLOSURE

A method of adhering envelopes to a carrier web for use in addressing, etc., the envelopes and for subsequently removing the envelopes from the carrier web for mailing, comprising the steps of spraying upwardly into a path intersecting the horizontal path of movement of the envelopes an aqueous dispersion of a polyvinyl chloride thermoplastic adhesive so as to apply a film of the adhesive onto discrete areas of the envelopes; feeding the envelopes onto the carrier web to bring the applied adhesive film into contact with the carrier web; heating the applied film for assisting in drying the dispersion and making the adhesive tacky; pressing the envelopes and carrier web together and thereby securely bond the envelopes to the carrier web to form a composite product thereof; and subsequently feeding the composite envelope and carrier web product along an elongated path; heating the applied adhesive of the composite product as it is fed along the elongated path for facilitating releasing the thermoplastic adhesive bond, and successively detaching the envelopes from the carrier web.

Apparatus for detaching the envelopes from the composite envelope and carrier web product is shown in FIGURES 5-7 and comprises a pair of laterally adjustable parallel rails for guiding the composite product along an elongated path and a pair of motor driven rollers for feeding the composite product along the rails. The rails have heating elements for heating the applied adhesive as the composite product is fed along the rails and a guide is provided for deflecting the carrier web downwardly at the forward end of the rails for permitting the envelopes to separate from the carrier web and to be fed by the rollers into a collector.

The present invention relates to the conveying of envelopes and the like in succession, as for example for automatic machine printing such as addressing, through the use of a carrier web and is more particularly concerned with the attaching of envelopes and the like onto and removing them from a carrier web. This application is a continuation-in-part application of my copending application entitled, Envelope Attaching Machine, Ser. No. 272,185, filed Apr. 8, 1963, now U.S. Patent No. 3,200,719, which in turn is a continuation of and was co-pending with my application, Ser. No. 93,214, filed Mar. 3, 1961, now abandoned.

Information storage devices and high-speed printers capable of translating the stored information into printed form have become useful and economical tools for the automatic printing, for example addressing and/or tabulating, of envelopes. Such automatic printing however conventionally requires individual and successive feeding of the envelopes through the printer preferably at a high rate of speed for maximum economy of equipment and operator time. For this reason a carrier sheet or web to which the envelopes are attached to form a composite envelope and carrier web product has been found useful in the conveying of the envelopes through the printer. For

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example, a type of composite envelope and carrier web product heretofore used for the automatic addressing of envelopes is disclosed in United States Patent No. 2,723,077 dated Nov. 8, 1955 and entitled Continuous Envelopes.

It is a principal aim of the present invention to provide an improved method of attaching paper blanks, such as envelopes, onto a carrier web and of subsequently removing the paper blanks from the carrier web which is adapted for high speed attaching and removal, which provides a composite product useful in the printing of the paper blanks with presently available machines, and which has notable utility in the attachment and removal of paper blanks not specially constructed for use in the method of the present invention.

It is another aim of the present invention to provide a method for attaching conventional envelopes onto and for removing them from the carrier web without blemishes marring the quality or appearance of the envelopes.

It is another aim of the present invention to provide an apparatus for detaching envelopes and the like from the carrier web in accordance with the method of the present invention which provides for removing the envelopes from the carrier web at a high rate of speed and without objectionable scarring of the envelopes.

It is a further aim of the present invention to provide an envelope detaching apparatus of economical and compact construction, which is useful by the unskilled and which is adapted for either intermittent or substantially continuous operation.

It is a still further object of the present invention to provide an improved method for attaching envelopes or the like to a carrier web which are of the type having end flaps or ears with lines of perforations provided for subsequently severing the envelope panels from the carrier web as described in the aforementioned United States Patent No. 2,723,077. Included in this object is a method of attaching the envelope side flaps onto the carrier web which ensures that the envelopes are securely retained on the carrier web during the subsequent handling of the composite envelope and carrier web product, which is useful in high speed attaching of the envelopes onto the carrier web and which ensures that upon severing of the envelope panels from the carrier web such is accomplished along the lines of perforations and without portions of the side flaps remaining with the panels.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth, and the scope of the application of which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a longitudinal top plan view, partly broken away, of an apparatus for attaching envelopes to a carrier web in accordance with the present invention;

FIGS. 2 and 3 are enlarged longitudinal section views, partly broken away, of portions of the apparatus of FIG. 1;

FIG. 4 is a fragmentary plan view of a composite envelope and carrier web product produced in accordance with the present invention and showing alternative ways of securing the envelope panels to the carrier web;

FIG. 5 is a longitudinal top plan view, partly broken away and partly in section, of an apparatus shown diagrammatically in part for removing the envelopes from the carrier web in accordance with the present invention;

FIG. 6 is an enlarged longitudinal section view, partly broken away, taken substantially along line 6-6 of FIG. 5; and

FIG. 7 is a transverse section view, partly broken away

and partly in section, taken substantially along line 7-7 of FIG. 6.

Several developments have been employed for the application of envelopes to a carrier web. One such development disclosed in the aforementioned United States Patent No. 2,723,077 consists of a pair of supplemental end flaps formed integrally with the envelope panels for attaching the envelopes to the carrier web and which are provided with suitable lines of perforations for subsequent severance of the envelope panels from the carrier web. Another such development is disclosed in United States Patent No. 2,691,327, dated Oct. 12, 1954 and entitled Envelope Assembling Apparatus. This development provides for forming a series of loops in a pair of spaced carrier tapes and for inserting the ends of the envelopes under these loops for attachment of the envelopes to the tapes. A third such development is disclosed in United States Patent No. 2,363,417, dated Nov. 21, 1944 and entitled Method of and Apparatus for Making Zig-Zag Folded Assemblies of Series-Connected Envelopes. This development provides for applying an even coating of adhesive to the front face of the envelope and thereby attach the envelope to the carrier web. For subsequently detaching the envelope, the carrier web is provided with suitable severance lines for separating that portion of the carrier web adhering to the front face of the envelope and which thereafter remains a part of the detached envelope.

Referring now to FIGS. 1-3 of the drawings, attachment of envelopes to a carrier web in accordance with the method of the present invention is accomplished in conjunction with the conveyance of a succession of the envelopes onto a carrier web or sheet 12 (FIG. 2) conventionally constructed of paper. With the illustrated machine of FIGS. 1-3, which is disclosed and described in more detail in my copending application Ser. No. 272,185, the envelopes are fed by a conveyor, generally denoted by the numeral 14, along an elongated horizontal path with the envelopes arranged in longitudinal alignment with the envelope panels extending transversely of their direction of movement. As fully described in the copending application Ser. No. 272,185, the conveyor 14 includes a chain conveyor portion 16 having a plurality of pairs of upstanding fingers 18 engageable with the trailing edges of successive envelopes, and a second conveyor portion 20 which includes a plurality of drive rollers 22-24 and co-operating spring mounted backup wheels 28.

The envelopes proceed forwardly from these drive rollers and backup wheels to between a carrier sheet guide roller 25 and its cooperating backup wheels 28 where the envelopes make initial contact with the carrier sheet 12. The carrier sheet and envelopes are thereafter conveyed together forwardly over a horizontal platform 32, to between a pressure roller 26 and its cooperating backup wheels 28 and to between a pair of cooperating wheels 36, 38, the latter of which is provided with peripheral teeth 39 for punching holes along the edges of the carrier sheet.

Located longitudinally intermediate the drive wheels 23, 24 and slightly below the path of travel of the envelopes are a pair of transversely spaced nozzles 40 which are mounted for being adjusted to lateral positions with respect to the ends of the envelope panels. The nozzles 40 are suitably connected for continuously spraying an adhesive during the operation of the conveyor whereby the adhesive is sprayed along the full longitudinal width of the envelopes as they are conveyed between the drive rollers 23, 24 and therefore just prior to the feeding of the envelopes onto the carrier sheet 12. The adhesive is sprayed upwardly by the nozzles 40 into jets of atomized adhesive for which purpose a liquid adhesive with a low viscosity is desirable. With the continuous spraying of the adhesive during the operation of the envelope conveyor, a light film of adhesive is applied on discrete areas of the envelope panels in stripes with the amount of adhesive

being minimal and gradually diminishing or "feathering" from a maximum concentration at the center of the stripes to their lateral rather undefined edges. For example, stripes of adhesive of about $\frac{3}{8}$ " wide can be applied by the described method with feathered edges of intermittent dots of the adhesive.

Where the envelopes are constructed with side flaps 41 as shown in FIG. 4, the liquid adhesive may usefully be a dispersion of a plastic adhesive in water and be sprayed onto the end flaps as the envelopes pass over the transversely spaced nozzles within the lateral confines of the longitudinally extending lines of perforations 43 forming the lines of severance between the end flaps and the envelope panels and the outer lateral edges of the end flaps.

In accordance with the preferred usage of the method of the present invention the envelopes are of conventional construction without the supplementary end flaps, in which instance the stripes of adhesive are applied directly to the envelope panels preferably adjacent the lateral edges of the envelopes, as shown in dotted lines in FIG. 4, whereby there is little or no application of the adhesive to the sealing flaps of the envelope notwithstanding whether the sealing flaps be fully extended, or folded into contiguous relationship with the envelope panels as seen in FIG. 4.

Where envelopes of conventional construction are employed the liquid adhesive utilized is preferably an aqueous dispersion of a thermoplastic material with the adhesive/water ratio being sufficient to provide effective atomization thereof by the nozzles 40.

It has been found that with the use of water as the adhesive carrier, the absorption rate of the adhesive by the envelope does not preclude a portion of the adhesive from adhering, as by absorption, to the carrier sheet even when only a very light film of the dispersion is sprayed onto the envelope panels. This is considered to be due in part to the relatively low rate of absorption of water by the usual envelope paper. Accordingly, with appropriate selection of the adhesive and the carrier sheet the adhesive dispersion will adhere to the carrier sheet and the carrier sheet will function in part to limit the adhesive absorption by the envelopes while at the same time the adherence of both members will be adequate to secure the envelopes to the carrier web for subsequent handling of the composite envelope and carrier sheet product.

Because of the continuous operation of the conveyor 14 and the short interval of time between the application of the adhesive to the underside of each envelope and the initial contact of the envelope with the carrier web, the adhesive applied to the envelopes will be sufficiently wet upon contact with the carrier web for adequately adhering the envelopes to the carrier web. This time interval is preferably held to a minimum and, of course, is a function of the speed of the envelope conveyor and the distance between the nozzles 40 and the place of initial contact of the envelopes with the carrier web. For example, it has been found that a time interval of less than one second and approximately one-third of a second provides highly successful results.

After feeding the envelopes onto the carrier web, the carrier web and envelopes travel together over the horizontal supporting platform 32 first passing beneath a pair of backup wheels 28 and thereafter beneath a pair of sealing assemblies 41 transversely adjustable by a screw 42 for appropriate alignment with the applied stripes of adhesive on the envelopes. Each sealing assembly is provided with a hold-down wheel 44 positioned inwardly of the line of adhesive and mounted on an arm 46 for pivotal movement about a pin 48 in response to the varying thickness of the composite web and envelope product. The force exerted by the hold-down wheel is provided by a compression spring 50 with the bias of the spring being adjustable with a handle 52. Each sealing assembly 41 also includes a heating shoe 54 pivotally mounted above the platform to a support 56 which is vertically reciprocable and urged

downwardly by an air cylinder 57 to force the heating shoe against the envelopes and thereby simultaneously heat the applied adhesive and press the envelopes into contact with the carrier web. The heating shoes are aligned with the lines of adhesive and are maintained at a temperature adequate to assist in evaporating the liquid carrier of the adhesive and thereby make the adhesive sufficiently tacky for adhering the envelopes to the carrier web. Concomitant with the formation of this preliminary bond between the envelopes and carrier web the heating shoes function to squeeze the adhesive between the envelopes and carrier web and thereby minimize the thickness of the adhesive film and increase the absorption of the adhesive. This application of pressure by the heating shoes is followed by a secondary application of pressure by the pressure roller 26 and its cooperating backup wheels 28 which are adapted for transverse adjustment into alignment with the lines of adhesive.

With the envelopes thereby securely attached to the carrier web, the composite envelope and carrier web product can be suitably folded in zig-zag or accordion fashion as described in the aforementioned pending United States application Ser. No. 272,185 for handling prior to its being fed through an appropriate printing machine for addressing the envelopes.

Subsequent to the printing operation, the envelopes are separated from the carrier web. When the envelopes are constructed with side flaps 41 the separating of the envelopes from the carrier web may be accomplished by a suitable stripping device through which the composite envelope and carrier web product is fed, the envelopes being appropriately engaged for tearing the envelope panels from the side flaps along the lines of perforations 43. Inasmuch as the stripes of adhesive have been applied along the full longitudinal length of the flaps 41, the flaps are secured to the carrier web even at their leading edges with resulting tearing along the lines of perforations being ensured and therefore without portions of the side flaps remaining with the envelope panels.

With the use of conventional envelopes, the envelopes can be successively and individually detached from the carrier web by the detaching apparatus of FIGS. 5-7, denoted generally by the numeral 70, through which the composite envelope and carrier web product is fed, as by a motor 72 shown diagrammatically in FIG. 5, or alternatively as where smaller quantities of envelopes are intermittently processed by a suitable manually operable crank (not shown).

The detaching apparatus 70 includes a pair of spaced elongated rails 74 mounted on a frame 75 with the rails each having a pair of spaced parallel guides 76, 78 with opposed bearing surfaces 80, 82 which, for example, may be constructed of fiberglass impregnated with "Teflon" for providing durable, low friction surfaces. The guides 76, 78 define coplanar elongated passages which receive the edge portions of the composite envelope and carrier web product, as seen in FIG. 4, preferably with the stripes of adhesive aligned centrally of the guides. For this purpose the mounting brackets 86 for the rails are made transversely adjustable on the frame 75 (FIG. 5) and may be provided with laterally adjustable shoes 87 (FIG. 7) engageable with the lateral edges of the composite envelope and carrier web product.

For inserting the composite envelope and carrier web product into the detaching apparatus, the composite product is manually fed through the rails to between a drive roller 90 and a backup wheel 92 which are rotatably mounted in upstanding stanchions 94 of the frame 75. The drive roller 90 is provided with an external layer 96 of resilient material, such as rubber, whereby a carrier sheet and an envelope passing between the roller and backup wheel are suitably engaged for being forwardly driven by the roller. As shown in FIG. 5 the roller 90 is driven by an electrical motor 72 through a belt and pulley drive 100 and a drive shaft 102, whereby after

initial insertion of the composite web and carrier product into the detaching apparatus the motor 72 may be energized for automatic feeding of the composite envelope and carrier web product through the detaching apparatus with the envelopes being collected in a longitudinally adjustable envelope catcher 104 having upright stop pins 106 for catching the envelopes emerging from between the roller 90 and the backup wheel 92.

Inclined downwardly from the longitudinal path of the composite envelope and carrier web product between the guides and adjacent the forward end of the parallel rails 74 is a transversely extending guide plate 110 fixed between the upright stanchions 94. A second transversely extending guide plate 112 partially overlapping the forward edge of the guide plate 110 but substantially forward thereof is mounted on a pair of levers 114, 115 secured to an axle 116 rotatably mounted on the stanchions 94. A compression spring 117 is interposed between the lever 114 and the adjacent stanchion 94 to urge the opposite lever 115 into engagement with its adjacent stanchion whereby a locating pin 118 fixed to the lever 115 may be aligned with an opening 119 in the stanchion to lock the guide plate 112 in its normal operating position shown in FIG. 5. However, by merely depressing the lever 114 against the compression spring 117 and thereby moving the locating pin 118 out of the opening 119 the guide plate 112 may be readily pivoted upwardly for the insertion of the composite envelope and carrier web product. Thereafter the guide plate 112 may be repositioned to displace the carrier web 12 downwardly out of the plane of the guides 76, 78 to between the cooperating guide plates 110, 112. For this purpose the transverse guide plate 112 is made longitudinally adjustable on the arms 114, 115 by the provision of slots 120 whereby the spacing between the transverse plates 110, 112 may be adjusted to accommodate the movement of the carrier web 12 therebetween. For providing a low friction surface, the transverse guide plate 112 may be covered with a suitable material 121, such as the aforementioned "Teflon" impregnated fiberglass.

The forward extension of the longitudinal path of travel of the carrier web between the rails 74 is substantially tangential to the drive roller 90, and the distance between the forward end of the rails 74 and the line of contact of the roller 90 and backup wheel 92 with the envelopes 10 is less than the longitudinal width of the envelopes whereby the normal rigidity of the envelopes 10 tends to cause them to break away from the carrier web and thereafter automatically feed to between the drive roller and backup wheel as the carrier web is deflected downwardly between the guide plates 110, 112. Once the leading edge of the envelope passes between the drive roller 90 and the backup wheel 92, the roller provides for the continued feeding and stripping of the envelope from the carrier web.

Because of the thermoplastic characteristic of the adhesive originally applied to the envelopes 10, heat may be employed in the detaching apparatus 70 for releasing the envelopes from the carrier web, which heating is also considered to effect further absorption of the adhesive. Each rail 74 has a pair of spaced heating elements 130 associated with the guides 76, 78, for which purpose these guides are made of a material having a high rate of thermoconductivity, such as aluminum, for maximum transmission of heat to the envelope and carrier web and to provide even temperature distribution in the area of the applied stripe of adhesive. By providing heating elements of suitable length and capacity, the temperature of the adhesive may be raised for releasing the envelopes from the carrier web.

To ensure adequate plasticity of the adhesive at the location where the envelopes initially break away from the carrier web a transversely extending heating element 131 is affixed to the underside of the transverse guide

plate 110 for which purpose the guide plate 110 is also preferably constructed of a material with a high rate of thermoconductivity, such as aluminum.

As the composite carrier web and envelope product is conveyed between the rails 74 the temperature of the thermoplastic adhesive is raised sufficiently to adequately release the envelopes, which release is automatically accomplished when the carrier web is deflected downwardly by the transverse guide plates 110, 112, the separation of the envelopes from the carrier web being due in part to the rigidity of the envelopes.

After removal of the envelopes from the carrier web, the envelopes are stacked in the catcher 104 and the carrier web is fed downwardly and where desirable is re-folded in accordion fashion for facilitating its subsequent handling.

Of significance to the successful attachment and detachment of the envelopes to the carrier web is the choice of the thermoplastic adhesive applied to the envelope panels. In this regard, it has been found that aqueous dispersions of thermoplastic materials, particularly vinyls, can be used with considerable success in the aforesaid method to provide an adhesive bond with suitable flexibility and elongation characteristics and with good absorption characteristics with paper. More specifically, adhesives utilizing polyvinyl acetate as either a homo or copolymer thereof are particularly useful, especially when the adhesives are plasticized to reduce their plasticity temperature, as, for example, provided by internal plasticization.

In order to prevent marking of the envelopes by the adhesive, and in particular where conventional white envelopes are employed, the thermoplastic adhesive employed is preferably colorless, i.e., transparent, translucent or milky appearing, so that it will not discolor the envelopes notwithstanding the presence of a minute amount of the adhesive on the surface of the envelopes after they are removed from the carrier web.

With the spraying of a polyvinyl dispersion onto the envelope panels in the manner described, and particularly where using an emulsion of polyvinyl acetate, it has been found that after the detachment of the envelopes the envelopes are unimpaired by residual adhesive tackiness, the applied stripe of adhesive is noticeable only under very close inspection, and the resulting envelopes are accordingly acceptable even where the highest envelope quality and appearance is to be obtained. This result is considered to be due in part to the light film of adhesive originally applied onto the envelopes by spraying and due in part to the division and absorption of the adhesive when the adhesive is heated for releasing the envelopes. Moreover, it is considered that by applying the adhesive by the aforementioned spraying technique, an adhesive bond with an irregular or intermittent edge is formed which, even if noticeable when the envelopes are subsequently detached from the carrier web, is without a definitive boundary marring the appearance of the envelope.

Thus it can be seen that the method of the present invention provides for attaching envelopes with end flaps or, in its more preferable usage, for attaching envelopes or other paper blanks of conventional construction. Where envelopes or other paper blanks with end flaps are used, the subsequent severing of the envelope panels from the end flaps along the lines of perforations is precisely accomplished and without removing portions of the end flaps, in particular the leading edge portions of the end flaps, with the removal of the envelope panels.

Where envelopes or other paper blanks of conventional construction without end flaps are employed, the paper envelopes may nevertheless be adequately secured to the carrier web for feeding through a printing machine and be subsequently removed from the carrier web without objectionable marring of the appearance or quality of the envelopes. The method is subject to the automatic attachment of the envelopes and subsequent automatic removal

of the envelopes by a detaching apparatus of the present invention capable of feeding the composite envelope and carrier web product and successively removing and collecting the envelopes at a high rate.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. A method of attaching paper blanks in succession onto an elongated sheet carrier web comprising the steps of longitudinally conveying paper blanks forwardly in succession along an elongated path, spraying into a jet intersecting the path of travel of the blanks an atomized dispersion of a thermoplastic adhesive for applying films of the dispersion onto discrete areas of the blanks as they are conveyed past the jet, longitudinally feeding a sheet carrier web with the blanks forward of the jet with the applied film in contact with the carrier web, heating the applied film for assisting in drying the dispersion and making the adhesive tacky, and pressing the blanks and carrier web together for securely bonding the blanks to the carrier web to form a composite product therewith.

2. A method of attaching paper envelopes in succession onto an elongated sheet carrier web, comprising the steps of longitudinally conveying paper envelopes forwardly in succession along an elongated path, spraying into a pair of transversely spaced jets intersecting the path of travel of the envelopes an atomized aqueous dispersion of a thermoplastic adhesive for applying films of the dispersion onto transversely spaced areas of the envelopes as they are conveyed past the jets, longitudinally feeding a sheet carrier web with the envelopes forward of the transversely spaced jets with the dispersion films in contact with the carrier web, and pressing the envelopes and carrier web together for bonding the envelopes to the carrier web to form a composite product therewith.

3. A method of attaching a first absorbent paper article onto a second absorbent paper article providing a carrier web for said first absorbent paper article, comprising the steps of spraying a film of an aqueous dispersion of a thermoplastic adhesive onto discrete areas of one of the absorbent paper articles, bringing the absorbent paper articles together with the dispersion film in contact with the other of the absorbent paper articles, heating the dispersion film for assisting in drying the dispersion and making the adhesive tacky, and pressing the absorbent paper articles together for securely bonding them together.

4. The method of claim 3 wherein the film is sprayed onto discrete areas of the first absorbent paper article and wherein the thermoplastic adhesive includes plasticized polyvinyl plastics.

5. A method of attaching paper blanks in succession onto an elongated sheet carrier web and of subsequently detaching the blanks from the carrier web, comprising the steps of longitudinally conveying paper blanks forwardly in succession along an elongated path, spraying into a pair of transversely spaced jets intersecting the path of travel of the blanks an atomized dispersion of a thermoplastic adhesive in water for applying films of the dispersion onto transversely spaced discrete areas of the blanks as they are conveyed past the jets with the films having edges of intermittent dots of the dispersion, longitudinally feeding a sheet carrier web with the blanks forward of the transversely spaced jets with the films in contact with the carrier web, providing for drying the dispersion and making the adhesive tacky, pressing the blanks and carrier web together for squeezing the tacky adhesive between the blanks and carrier web and for securely bonding the blanks to the carrier web to form a composite product therewith, and for detaching the blanks from the carrier web, feeding the composite blanks and carrier web product along an elongated path, heating the applied adhesive

for reducing the adhesive bond, and successively stripping the blanks from the carrier web.

6. A method of attaching absorbent paper blanks in succession onto an elongated absorbent paper carrier web and of subsequently detaching the blanks from the carrier web, comprising the steps of longitudinally conveying absorbent paper blanks forwardly in succession along an elongated path, spraying into a jet intersecting the path of travel of the blanks an atomized aqueous dispersion of a thermoplastic adhesive for applying films of the dispersion onto discrete areas of the blanks as they are conveyed past the jet, longitudinally feeding an absorbent paper carrier web with the blanks forward of the jet with the applied film in contact with the carrier web, pressing the blanks and carrier web together for bonding the blanks to the carrier web to form a composite product therewith, and for detaching the blanks from the carrier web, feeding the composite blanks and carrier web product along an elongated path, heating the composite product at the discrete areas of the applied adhesive for softening the adhesive, and successively stripping the blanks from the carrier web.

7. A method of attaching paper blanks in succession onto an elongated sheet carrier web for forming a composite envelope and carrier web product having utility in the automatic printing of the paper blanks and of subsequently detaching the blanks from the carrier web, comprising the steps of applying onto spaced discrete areas of paper blanks a film of a thermoplastic adhesive, applying the blanks onto a sheet carrier web in succession with the applied film in contact with the carrier web and thereby bond the blanks onto the carrier web to form a composite product therewith, and subsequent to the automatic printing of the blanks, heating the adhesive for softening the adhesive, and stripping the blanks from the carrier web.

8. A method of attaching absorbent paper envelopes in succession onto an elongated absorbent paper carrier web for forming a composite envelope and carrier web product having utility in the automatic printing of envelopes and of subsequently detaching the envelopes from the carrier web, comprising the steps of longitudinally conveying absorbent paper envelopes forwardly in succession along an elongated path with the envelope panels positioned transversely of the path and in longitudinal alignment, spraying into a pair of transversely spaced jets intersecting the path of travel of the envelope panels an atomized aqueous dispersion of thermoplastic adhesive for applying films of the dispersion onto transversely spaced discrete areas of the envelope panels as they are conveyed past the jets, longitudinally feeding an absorbent paper carrier web with the envelopes forward of the transversely spaced jets with the applied films in contact with the carrier web, pressing the envelopes and carrier web together for bonding the envelopes onto the carrier web to form a composite envelope and carrier web product, and subsequent to the automatic printing of the envelopes, feeding the composite envelope and carrier web product along an elongated path, heating the adhesive for facilitating releasing the adhesive bond, and successively detaching the envelopes from the carrier web.

9. A method of attaching absorbent paper envelopes in succession onto an elongated absorbent paper carrier web for forming a composite envelope and carrier web product having utility in the automatic printing of envelopes and of subsequently detaching the envelopes from the carrier web, comprising the steps of longitudinally conveying absorbent paper envelopes forwardly in succession along an elongated path with the envelope panels positioned transversely of the path, continuously spraying into a pair of transversely spaced jets intersecting the path of travel of the envelope panels an atomized substantially colorless aqueous emulsion of thermoplastic polyvinyl adhesive for applying films of the emulsion in stripes onto the envelope panels as they are conveyed past the jets with the stripes having transverse edges of intermittent dots of the emul-

sion, longitudinally feeding forward of the transversely spaced jets an absorbent paper carrier web with the succession of envelopes with the stripes of adhesive emulsion in contact with the carrier web, simultaneously heating the stripes of adhesive emulsion and pressing the carrier web and envelopes together along the stripes of adhesive for bonding the envelopes to the carrier web, and subsequent to the automatic printing of the envelopes, feeding the composite envelope and carrier web product along an elongated path, applying heat from both sides of the composite product adjacent the stripes of adhesive for facilitating releasing the adhesive bond, and successively detaching the envelopes from the carrier web.

10. A method of attaching onto an elongated carrier web a succession of envelopes having separable paper end tabs to form a composite carrier web and envelope product comprising, forwardly conveying in succession along an elongated path a plurality of envelopes positioned with the end tabs at the transverse ends thereof and in longitudinal alignment, continuously spraying liquid adhesive upwardly into the path of travel of the separable end tabs for applying liquid adhesive along the full length thereof, forwardly conveying the envelopes in succession onto a forwardly moving carrier web with the adhesive applied to the end tabs in contact with the web, and applying pressure to the end tabs for adhering the envelopes to the carrier web.

11. A method of attaching onto an elongated carrier web a succession of envelopes having paper end tabs separable by lines of perforations to form a composite envelope and carrier web product comprising the steps of, conveying a succession of envelopes along an elongated path with the envelope panels positioned with the tabs at the transverse ends thereof and in longitudinal alignment, continuously spraying upwardly into a pair of transversely spaced jets intersecting the path of travel of the end tabs an atomized aqueous dispersion of adhesive for applying the adhesive dispersion in stripes along the full length of the end tabs, longitudinally feeding forward of the transversely spaced jets a paper carrier web together with the envelopes with the adhesive dispersion stripes in contact with the carrier web, and applying heat and pressure to the end tabs for adhering the envelopes to the carrier web.

12. An apparatus for detaching paper blanks from an elongated paper carrier web onto which the envelopes are attached in succession by a thermoplastic adhesive on laterally spaced areas thereof to form a composite product therewith, comprising a frame, a pair of elongated transversely spaced rails mounted on the frame having longitudinally extending guides for closely guiding the composite product forwardly in an elongated path therealong and longitudinally extending heating elements associated with the guides for applying heat through the guides to the composite product at the laterally spaced areas of thermoplastic adhesive, means for feeding the composite product through the apparatus, and means providing for deflecting the carrier web out of said elongated path for assisting in stripping the paper blanks from the carrier web.

13. An apparatus for detaching paper blanks from an elongated carrier web onto which the blanks are attached in succession by thermoplastic adhesive on laterally spaced areas thereof to form a composite product therewith useful in the printing of the blanks comprising, a frame, a pair of elongated transversely spaced rails mounted on the frame having a pair of opposed longitudinally extending guides for closely guiding the composite product forwardly in an elongated path therealong and longitudinally extending heating elements associated with the guides for applying heat through the guides to the composite product at the laterally spaced areas of thermoplastic adhesive, a transverse guide plate adjacent the forward end of the guides, a transverse heating element associated with the transverse guide plate for applying

heat through the guide plate to the composite product, and means for feeding the composite product along the elongated path and for deflecting the carrier web out of the elongated path forward of the rails for assisting in stripping the blanks from the carrier web.

14. An apparatus for detaching envelopes from an elongated carrier web onto which the envelopes are attached in succession by thermoplastic adhesive on laterally spaced areas thereof to form a composite envelope and carrier web product useful in the printing of the envelopes comprising, a frame, a pair of elongated transversely spaced rails mounted on the frame, each of the rails having a pair of opposed longitudinally extending guides for closely guiding the composite envelope and carrier web product forwardly in an elongated path therealong and longitudinally extending heating elements associated with the guides for applying heat through the guides to the composite product at the laterally spaced areas of thermoplastic adhesive, a drive roller and cooperating backup wheel means mounted on the frame forward of the rails for rotation about transversely extending axes for receiving the carrier web therebetween, a first transverse guide plate inclined to said elongated path from adjacent the forward end of the rails, a transverse heating element associated with the first transverse guide plate for applying heat through the first transverse guide plate to the composite product, a second transverse guide plate mounted on the frame for cooperation with the first transverse guide plate for deflecting the carrier web out of said elongated path, and means for driving the drive roller for feeding the composite product through the apparatus.

15. An apparatus for detaching paper blanks from an elongated carrier web onto which the paper blanks are attached in succession by thermoplastic adhesive on laterally spaced areas thereof to form a composite product useful in the printing of the blanks comprising, a frame, a pair of elongated transversely spaced rails mounted on the frame, each of the rails having a pair of opposed longitudinally extending guides for closely guiding the composite product forwardly in an elongated path therealong and longitudinally extending heating elements associated with the guides for applying heat through the guides to the composite product at the laterally spaced areas of the thermoplastic adhesive, a drive roller and cooperating backup wheel means mounted on the frame forward of the rails for rotation about transversely extending axes for receiving the carrier web and paper blanks therebetween forward of the guides and at a distance from the guides less than the longitudinal width of the paper blanks, means for driving the drive roller for feeding the composite product through the apparatus, and means for deflecting the carrier web out of the elongated path forward of the rails for assisting in stripping the paper blanks from the carrier web.

16. An apparatus for detaching paper blanks from an elongated carrier web onto which the paper blanks are attached in succession by thermoplastic adhesive on laterally spaced areas thereof to form a composite product useful in the printing of the paper blanks comprising, a frame, a pair of elongated transversely spaced rails mounted on the frame, each of the rails having a pair of opposed longitudinally extending guides for closely guiding the composite product forwardly in an elongated path therealong and longitudinally extending heating elements associated with the guides for applying heat through the guides to the composite product, means for transversely adjusting at least one of the rails for positioning the guides into overlying relationship with the laterally spaced areas of adhesive on the composite product, a drive roller and cooperating backup wheel means mounted on the frame forward of the rails for rotation about transversely extending axes for receiving the carrier web and envelopes therebetween forward of the guides and at a distance from the guides less than the longitudinal width of the paper blanks, a first transverse guide having a

guide surface inclined to said elongated path from adjacent the forward end of the rails, a transverse heating element associated with the first transverse guide for applying heat therethrough to the composite product, a second transverse guide mounted on the frame for cooperation with the first transverse guide for deflecting the carrier web out of said elongated path, means for pivoting the second transverse guide out of cooperation with the first transverse guide for inserting the composite product into the apparatus, and means for driving the drive roller for feeding the composite product through the apparatus.

17. A method of attaching a first absorbent paper article onto a second absorbent paper article providing a carrier web for said first absorbent paper article, comprising the steps of spraying a film of adhesive onto discrete areas of one of the absorbent paper articles, bringing the absorbent paper articles together with the adhesive film in contact with the other of the absorbent paper articles, and pressing the absorbent paper articles together for securely bonding them together with the adhesive film.

18. A method of attaching sheet blanks in succession onto an elongated sheet carrier web and of subsequently detaching the blanks from the carrier web, comprising the steps of longitudinally conveying sheet blanks forwardly in succession along an elongated path, spraying into at least one jet intersecting the path of travel of the blanks an adhesive for applying films of the adhesive onto discrete areas of the blanks as they are conveyed past the jet, longitudinally feeding a sheet carrier web with the blanks forward of the jet with the films in contact with the carrier web for bonding the blanks to the carrier web to form a composite product therewith.

19. The method of claim 18 wherein the spraying step comprises spraying the adhesive upwardly into a pair of transversely spaced jets intersecting the path of travel of the blanks.

20. A method of attaching onto an elongated carrier web a succession of envelopes having separable end tabs to form a composite carrier web and envelope product comprising, forwardly conveying in succession along an elongated generally horizontal path a plurality of envelopes positioned with end tabs at the transverse ends thereof and in longitudinal alignment, spraying adhesive upwardly into the path of travel of the separable end tabs for applying liquid adhesive thereon, and forwardly conveying the envelopes in succession onto a forwardly moving carrier web with the adhesive applied to the end tabs in contact with the web for adhering the envelopes thereto.

21. A method of attaching individual sheet elements in succession onto an elongated sheet element providing a carrier web and for forming a composite product thereof with discrete areas of the individual sheet elements adhering to discrete areas of the carrier web comprising the steps of spraying an adhesive film onto discrete areas, and bringing the individual sheet elements together with the carrier web with the sheet elements in succession therealong and the adhesive providing a bond between the discrete areas of the sheet element and the discrete areas of the carrier web to form said composite product.

22. The method of claim 21 wherein the spraying step comprises spraying an atomized adhesive onto discrete areas.

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