

[54] REVERSIBLE TIP-ON MACHINE

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[58] Field of Search 270/53-55, 57

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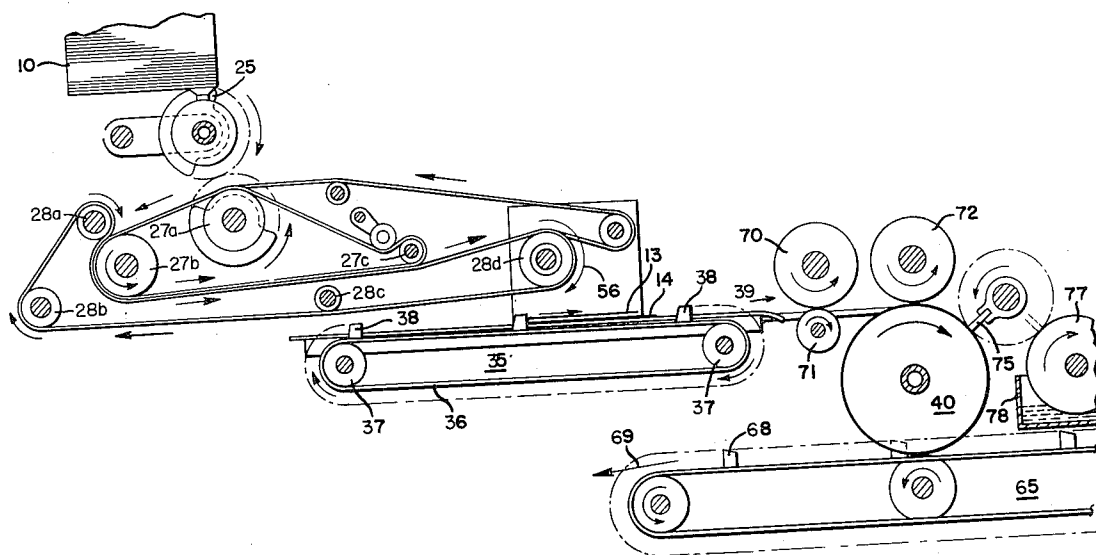
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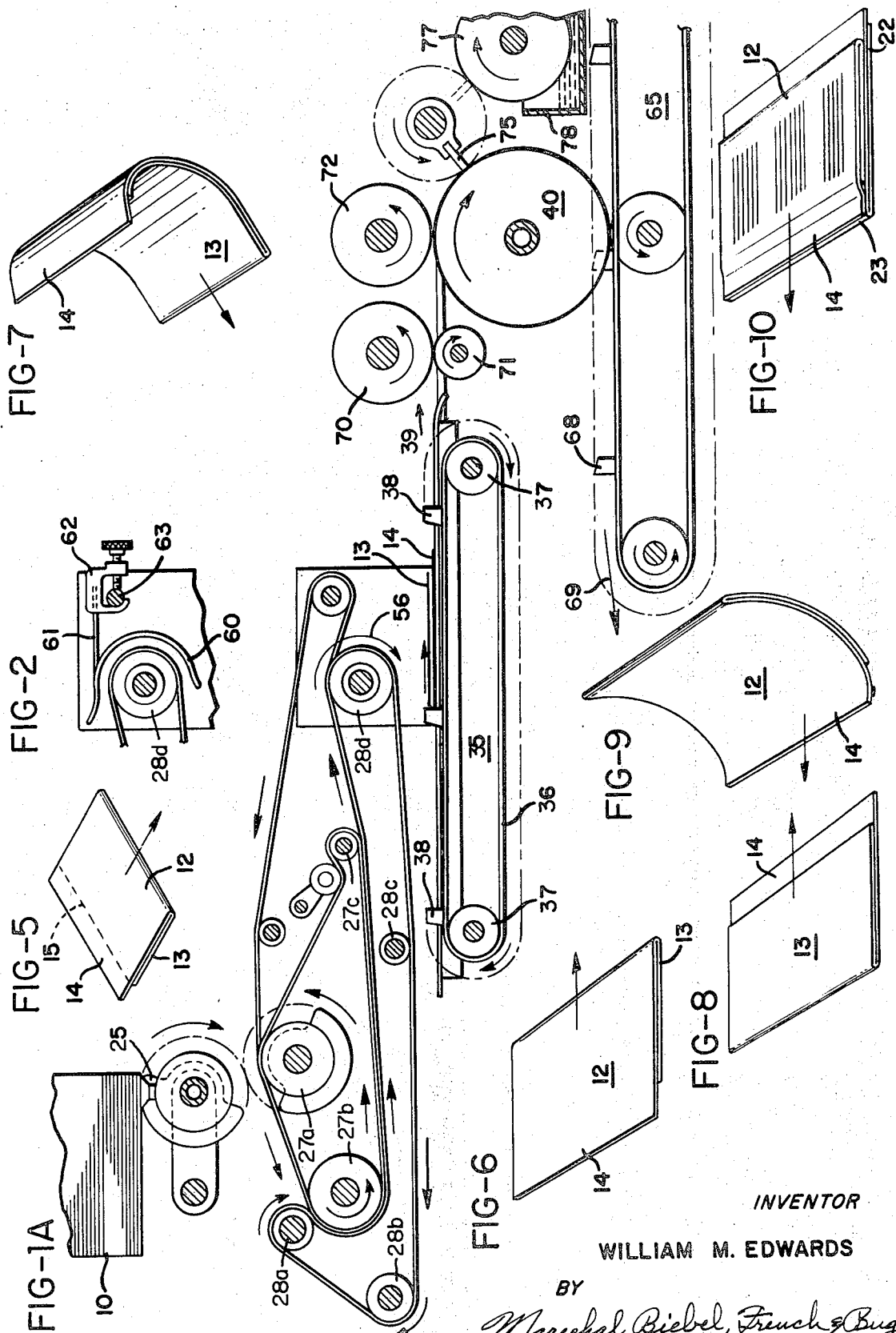
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[57] ABSTRACT

A machine for applying inserts to signatures to be gathered into books or magazines is provided with a reversible insert conveyor which can selectively orient either a leading or a trailing edge of an insert to coincide with the backbone edge of a corresponding signature. This allows multi-leaf inserts to be fed initially with a folded edge forward, and then re-oriented to position a free edge of one leaf along the backbone edge of an insert, whereby a fold-out multi-leaf insert is readily accommodated into the magazine.

3 Claims, 12 Drawing Figures



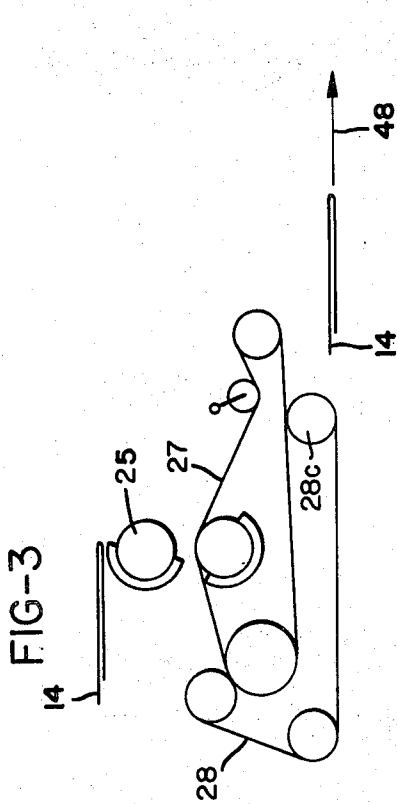
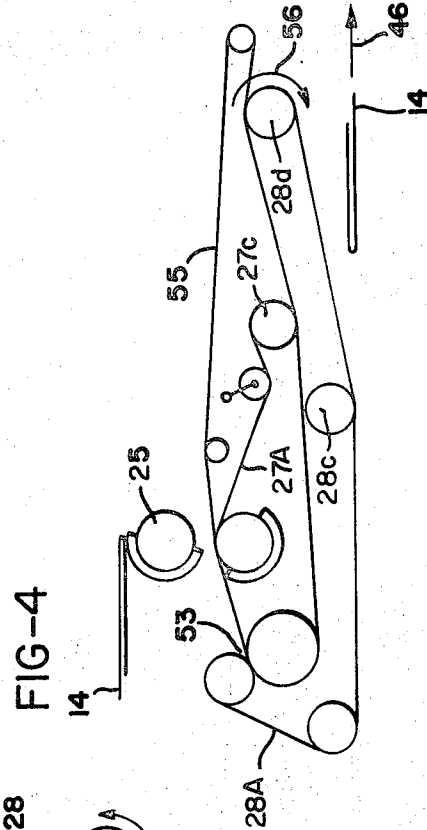
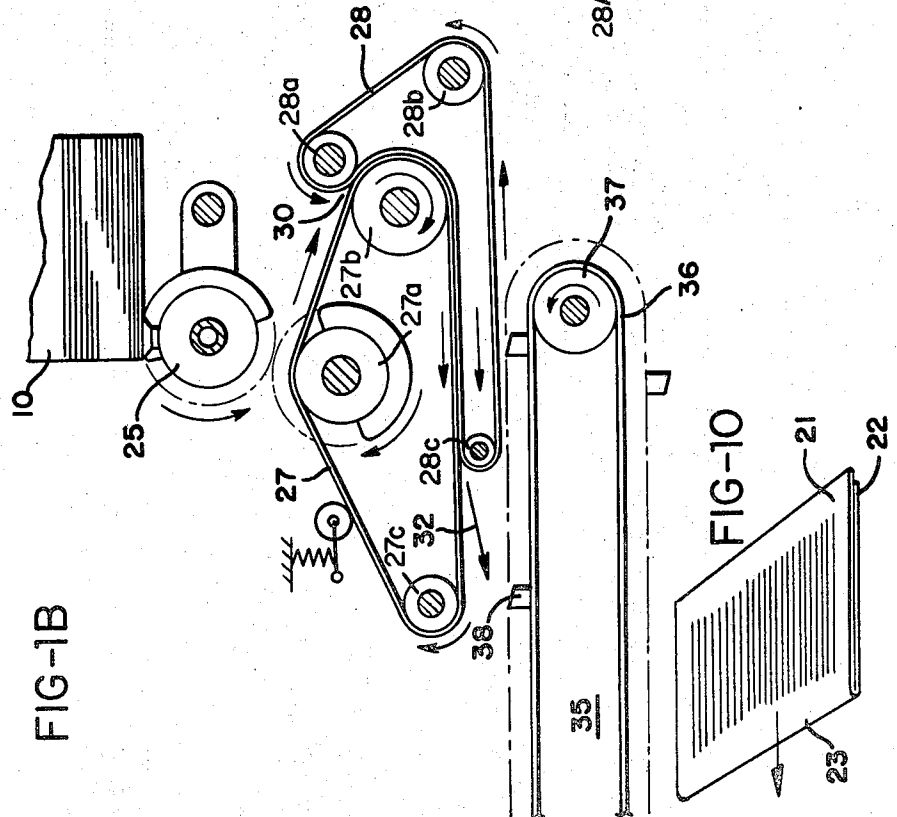
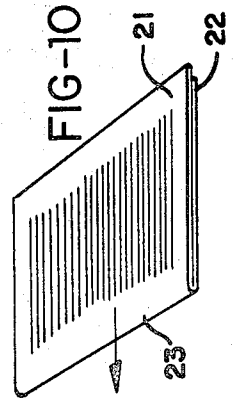


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REVERSIBLE TIP-ON MACHINE

BACKGROUND OF THE INVENTION

The invention relates to machines for applying inserts which ultimately become part of a bound magazine. It has become increasingly popular particularly in connection with various advertising schemes, to add inserts, many of which are of the removable type, as supplementary items in magazines. The most typical type of insert is an extra leaf or leaves, sometimes not numbered according to the magazine pages, which are adhered to one of the pages by gluing the leaf to a signature which is subsequently gathered and bound into the magazine. As these inserts increase in number and complexity, a number of them have been provided as two or even three leaf fold-out inserts attached at one end to a particular signature. They are initially contained within the magazine, and when open folding out to twice or even more times the width of a page in a magazine.

In order to provide the most convenient arrangement for attaching, and subsequently detaching by the consumer, of these inserts, it has been proposed that the edge of the insert leaf be glued to a given signature which is bound into the magazine, and thus one of the folded portions of a multiple leaf insert extends beyond the edge of the other parts, and is arranged to receive some adhesive. The insert is then joined along this extended edge to the signature.

Machines for applying inserts to magazines signatures are well known in the trade, and have been used for a number of years, however these machines were designed to operate primarily with single leaf inserts. A typical such machine is manufactured and sold by Magnacraft Manufacturing Company, of Chicago, Illinois, and the machine is commonly referred to in the trade as a "tip-on machine." In these machines, however, there is no adequate provision for the handling and application of multiple leaf folded inserts.

In a typical such tip-on machine, the supply or signatures to which inserts are attached is placed in the feed hopper and the signatures are fed one at a time to a signature conveyor, with the signatures being conveyed in a direction such that the folded edge is the leading or foremost edge as the signatures move on the conveyor. The insert sheets are supplied from a separate hopper, and are conveyed past an adhesive applicator, and then placed onto the signatures on the signature conveyor. Adhesive is applied along the edge of the insert which ultimately rests on or adjacent to the folded edge of the signature to be bound into the backbone of the magazine. When it is desired to use multiple leaf folded inserts, these can only conveniently be fed from their supply hopper by feeding the folded edge first, otherwise the feeding and conveying operation causes the inserts to open up and tangle in the mechanism. The orientation of the insert feeding conveyor mechanism is such that in the ordinary machine the folded edge of the insert will ultimately come to rest along the folded or backbone edge of the signature. This is satisfactory where it is desired to have the insert adhered along its folded edge to the signature, and thus open along the middle of the insert from the page of the magazine. However, where one edge of the entire multiple leaf insert is to be adhered to the page, the orientation provided in the machine is opposite of what is needed, and

these machines cannot perform the desired insert operation.

SUMMARY OF THE INVENTION

In accordance with the present invention, the insert conveyor is of a type which can be reversed in operation by relatively simple changes made in its parts, whereby multiple leaf folded inserts can be presented to the adhesive applicator in opposite from the ordinary orientation, such that the adhesive is applied to an extending flap of the insert, and this flap in turn rests against and is adhered to the backbone section of the signature as the insert is moved onto the signature by the mechanism. The versatility of the tip-on machine is thus increased, at relatively little cost, and the conversion for purposes of reversing the orientation of the insert as it is fed can be made quickly with little down time for purposes of adjusting and maintenance of the machine.

It is accordingly the principal object of this invention to provide a reversible tip-on machine for applying inserts to the signatures of a magazine, whereby the inserts may be supplied from the conventional feed hopper in the most convenient manner, and multiple leaf inserts can be fed along their folded edge to avoid jamming, with the orientation of the inserts arranged such that either the initial leading folded edge of the insert may be applied to the backbone section of the signature, or if desired a free edge flap of the insert may be adhered to the backbone section of the signature; another object of the invention is to provide a mechanism for this purpose by which commercially available tip-on machines may be modified to perform a function of reversing the orientation of the inserts prior to the application of the signatures.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIGS. 1A and 1B are schematic drawings of the essential elements of a typical tip-on machine, with the insert conveying mechanism arranged for reversal of the orientation of the inserts;

FIG. 2 is a fragmentary detail view of a portion of the insert conveying mechanism;

FIG. 3 is a schematic diagram illustrating an arrangement of parts in a conventional tip-on machine, specifically in the insert feeding thereof;

FIG. 4 is a diagrammatic view of the insert conveying mechanism shown in FIG. 1A providing a comparison with the ordinary insert conveying mechanism shown in FIG. 3;

FIG. 5 is a perspective drawing of a two leaf folded insert, with an extending attachment flap as fed on the insert supply hopper in FIG. 1A;

FIG. 6 is a similar view of an insert showing its orientation as it passes through the belts of the initial part of the insert conveying mechanism;

FIG. 7 is a view showing the insert as it exits from the first or belt conveyor portion of the insert conveying mechanism;

FIG. 8 is a perspective showing its orientation as it moves onto the final insert conveying device, for presentation to the adhesive at the applicator section;

FIG. 9 is a view of the insert as it passes through the adhesive applicator and moves toward the signature conveyor;

FIG. 10 is a view, located below FIG. 1B, showing the orientation of a signature on the signature conveyor; and

FIG. 11 is a view showing the extended edge flap of the two leaf folded insert adhered to the backbone section of a signature.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1A, a hopper 10 is shown diagrammatically, containing a quantity of inserts (FIG. 5) to be applied to signatures which ultimately are bound into a book or magazine. The insert is of the multiple leaf type, as shown in FIG. 10, including a first leaf 12, a folded-under second leaf 13, and an extended edge or flap 14, which is adapted to be incorporated into the backbone of the magazine. Referring to FIG. 1B, hopper 10 contains a quantity of signatures (FIG. 10) containing first and second leaves 21 and 22 joined at a folded edge 23 which is adapted to be bound into the backbone of a magazine. It should be noted with respect to each of the hopper in each case that the orientation of the inserts and of the signatures, respectively, is such that the folded edge of these pieces is the leading edge as they are fed from the hopper. As a practical matter, it is not feasible to feed a double folded piece of this kind with the open edges of the piece foremost, thus operating expediency requires that in each case the folded edge of the piece be the leading edge as the piece moves from the hopper.

In this particular instance, it is desired to combine the two leaf insert with the signature such that the flap 14 lies along the edge 23 of the signature, and thus is fastened into the backbone of the magazine. If desired, the insert may include a score or perforation 15, along which the insert may ultimately be separated from the remainder of the magazine, if this is the desire. For example, in some advertising or promotional schemes, the two leaf folded insert may be a tear-out piece, in which part or all of the insert is returned to the advertiser. The combined insert and signature is shown in FIG. 10.

Referring again to FIG. 1B, a conventional vacuum gripper feed wheel 25 takes the signatures from the hopper 10, one at a time, and transfers them to a conventional signature supply belt conveyor, which comprises an upper feed belt 27 and a lower feed belt 28, guided around and driven by appropriate corresponding rollers 27a, b, c and 28a, b, c, as shown. The belts come together forming a nip at 30, and the belts travel together from this nip down to the central region of the lower flight of the belt 27, where the belts separate at roller 28c and the signature moves from the supply conveyor as indicated by the arrow 32 onto the main insert conveyor 35. This conveyor is also of a conventional type, and preferably is constructed (see FIG. 1A also) of one or more chains 36 extending around and driven by sprocket 27 at its opposite ends, and carrying spaced pusher members or lugs 38 which in effect define pockets between them on the surface of the chains to push the individual signatures along the conveyor 35 to its discharge, indicated by arrow 39 in FIG. 1A. In the process of this movement, the signatures are carried past an insert applicator cylinder 40 which is lo-

cated at a station along the upper flight of signature conveyor 65 where individual insert pieces are applied to the individual signatures, with proper orientation of both pieces.

Referring to FIG. 3, the schematic representation shown therein is of a typical insert feeding arrangement wherein the flap 14 of a double folded insert is the trailing edge, and the folded leading edge of the insert is taken by vacuum grip feed wheel 25 and carried onto a conventional insert supply belt conveyor having an upper belt member 27 and a lower belt 28 which cooperate to take the inserts and discharge them at a lower level, as shown, with the free flap 14 trailing and the inserts moving generally as indicated by the arrow 48. This is the conventional orientation of the insert feed conveyor, as presently used on the conventional "tip-on" machines mentioned at the beginning of this specification.

Referring now to FIG. 4, the insert is shown leaving the hopper in the same position, with the flap 14 trailing, and the vacuum grip feeder 25 (also shown in FIG. 1A) is shown taking the inserts one at a time with the folded edge leading, and transferring the inserts to a novel insert feed conveyor arrangement which ultimately delivers the insert with the flap 14 in the leading position, as shown in FIG. 4 with the direction of movement indicated by the arrow 46. The conveyor mechanism includes three belts guided by rollers as shown; an upper belt 27A (same as 27 in FIG. 3) cooperates with the lower belt 28A to form a receiving nip 53 into which the insert is delivered from the vacuum grip feeder 25. These belts move together up to the region of the roller 27c, where the upper belt 27A departs the lower belt. The lower belt is longer than, and substitutes for, belt 28. An intermediate belt 55 also extends along the path where the belts 27A and 28A move in common, and the belt 55 continues adjacent the lower belt 28A past the roller 27c to an exit point at roller 28d where the belts 28A and 55 depart from each other and the insert is guided, with its folded edge leading, generally in the direction indicated by arrow 56. This arrow is also shown in FIG. 1A, and the orientation of the insert is shown in FIG. 6.

The detail drawing in FIG. 2 indicates the arrangement of one or more adjustable hook-shaped guides 60 which include a mounting extension 61 fastened into a bracket 62 that is clamped onto a stationary cross member 63. The inserts carried between belts 28A and 55 pass into the turn defined by the hook-shaped guides 60, thus the folded leading edge of the insert is directed to move reversely from the normal arrangement shown in FIG. 3.

The inserts pass onto main insert conveyor 35, in reverse fashion on conveyor 35, as shown in FIG. 8. The conveyor 35 carries the inserts forward, left to right, as viewed in FIG. 1A, into the nip between a pair of feeding rolls 70 and 71, which in turn pass the inserts between the insert applicator cylinder 40 and a further guide roller 72. The cylinder 40 may include conventional grippers (not shown) to engage the leading edge of the insert and carry it along the periphery of the cylinder, or it may employ vacuum gripping devices. As the insert is so moved by the cylinder 40, a gluing device in the form of one or more rotating bars 75 applies at least one spot or strip of glue to the flap 14 of the insert. The glue on the spotting bar or bars 75 is replen-

ished from a roller 77 rotating in a quantity of suitable glue or adhesive within a shallow tank 78.

At this point, as previously mentioned, the insert is moving with the flap 14 as the leading edge, having been reversed in position and the folded edge of the insert (which previously was leading) having been picked up by an appropriate one of the lugs 38 in the insert conveyor 35. As the insert moves around the insert cylinder 40, and glue is applied to the flap 14, the position of the insert is generally as shown in FIG. 9. The cylinder 40 brings the insert onto a signature moving along the signature conveyor 65 with its folded edge 23 foremost (FIG. 10) pushed by lugs 68, and the flap 14 is adhered to the folded edge of the signature, thus securing the two pieces as they discharged at 69 for subsequent binding into a magazine with the insert in proper orientation for folding outward from the leaf or open edge of the magazine, and for subsequent removal if desired.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In a machine for applying inserts to signatures intended for gathering into books or magazines, said machine having a signature conveyor arranged to carry individual signatures along a predetermined path with the backbone edge of the signatures all in the same alignment, supply means for inserts to be attached to each of said signatures, means for feeding the inserts singly from said supply means each in a predetermined alignment, and an adhesive applicator located in spaced relation to said supply means for applying an adhesive to secure each insert to a corresponding signature; an insert conveyor located between said insert feeding means and said adhesive applying means, said insert conveyor accepting the inserts in said predetermined alignment and discharging the inserts at a first discharge location to said adhesive applying means; the improvement comprising:

additional insert conveyor means selectively cooperable with said insert conveyor to receive the inserts and carry them to a second discharge location, and said insert conveyor means including at said second discharge location guide means reversing the movement of the inserts front to rear with respect to the alignment of the inserts as received from said feeding means whereby either the leading or trailing edge of the inserts as accepted from said feeding means can be made to coincide with the backbone edge of signatures on said signature conveyor.

2. A machine as defined in claim 1 wherein said supply means is a hopper and the inserts are folded multi-leaf inserts fed serially from said hopper with folded edge foremost, said insert conveyor means including removable and alternatively used belt members operable to carry the inserts to said second discharge location.

3. In a reversible tip-on machine for applying folded inserts to the signatures of a magazine whereby the insert is attached to the finished magazine only through a single leaf, comprising

a signature conveyor for carrying individual signatures along a path with the folded backbone edge of each signature in the same alignment, a supply hopper for folded inserts and feeding means for removing the inserts from said hopper with the folded edge foremost,

means for applying adhesive to an edge of said inserts at a location adjacent said signature conveyor, and insert conveyor means receiving the folded inserts from said feeding means and moving the inserts along a first feed path with the folded edge foremost past said adhesive applying means and onto the signatures carried on said signature conveyor; the improvement comprising

a reversing section selectively connectable to said insert conveyor means providing an alternate feed path for the inserts in which the feeding motion of the inserts is reversed end for end such that the feeding motion of the inserts continues with the free edge of the insert in position to receive adhesive and subsequently to attach to the folded edge of the signatures.

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