

Jan. 7, 1969

E. GUGGISBERG
METHOD OF AND APPARATUS FOR STUFFING PRINTED
MATTER WITH INSERTS

3,420,516

Filed Sept. 24, 1965

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FIG. 1

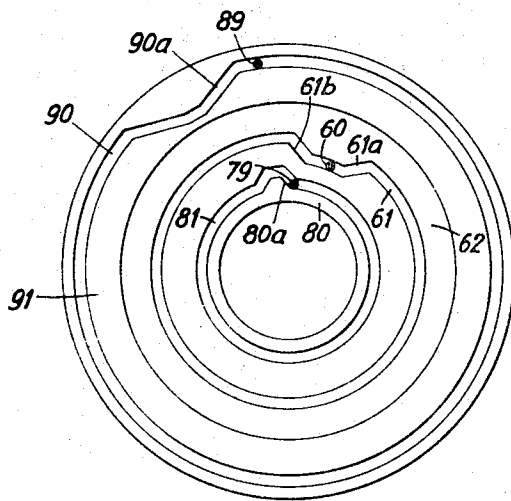
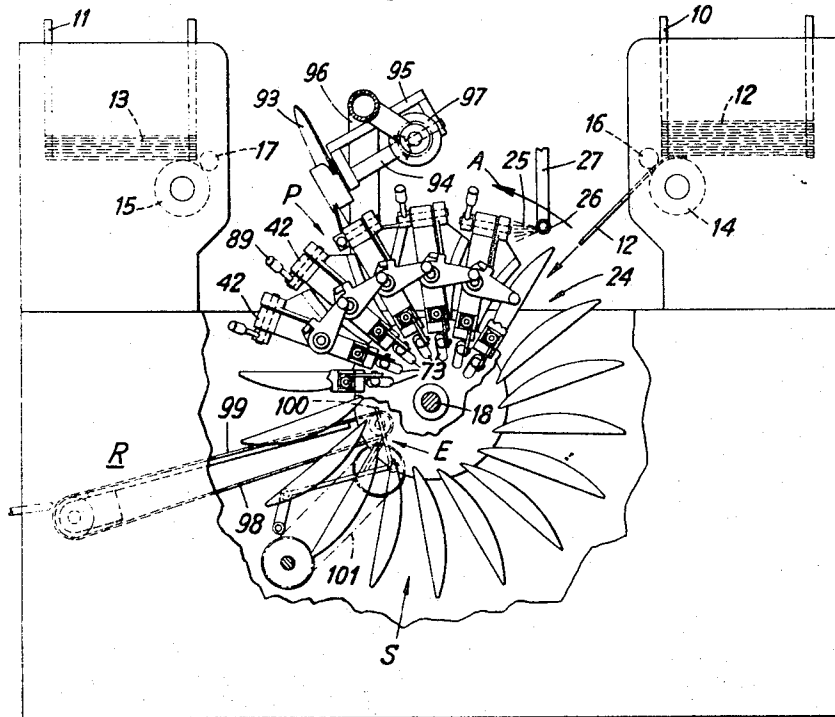


FIG. 2a

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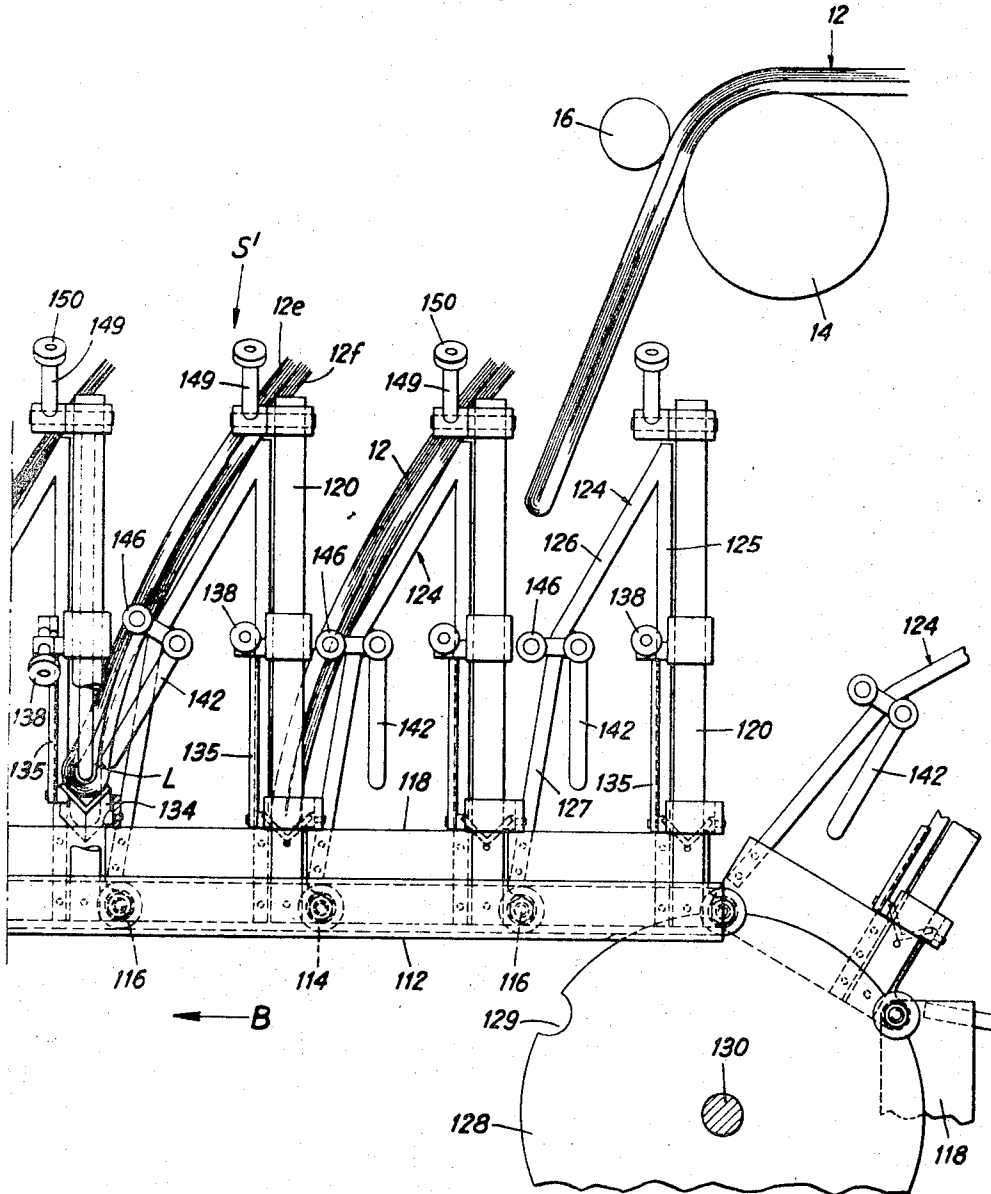
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FIG. 4



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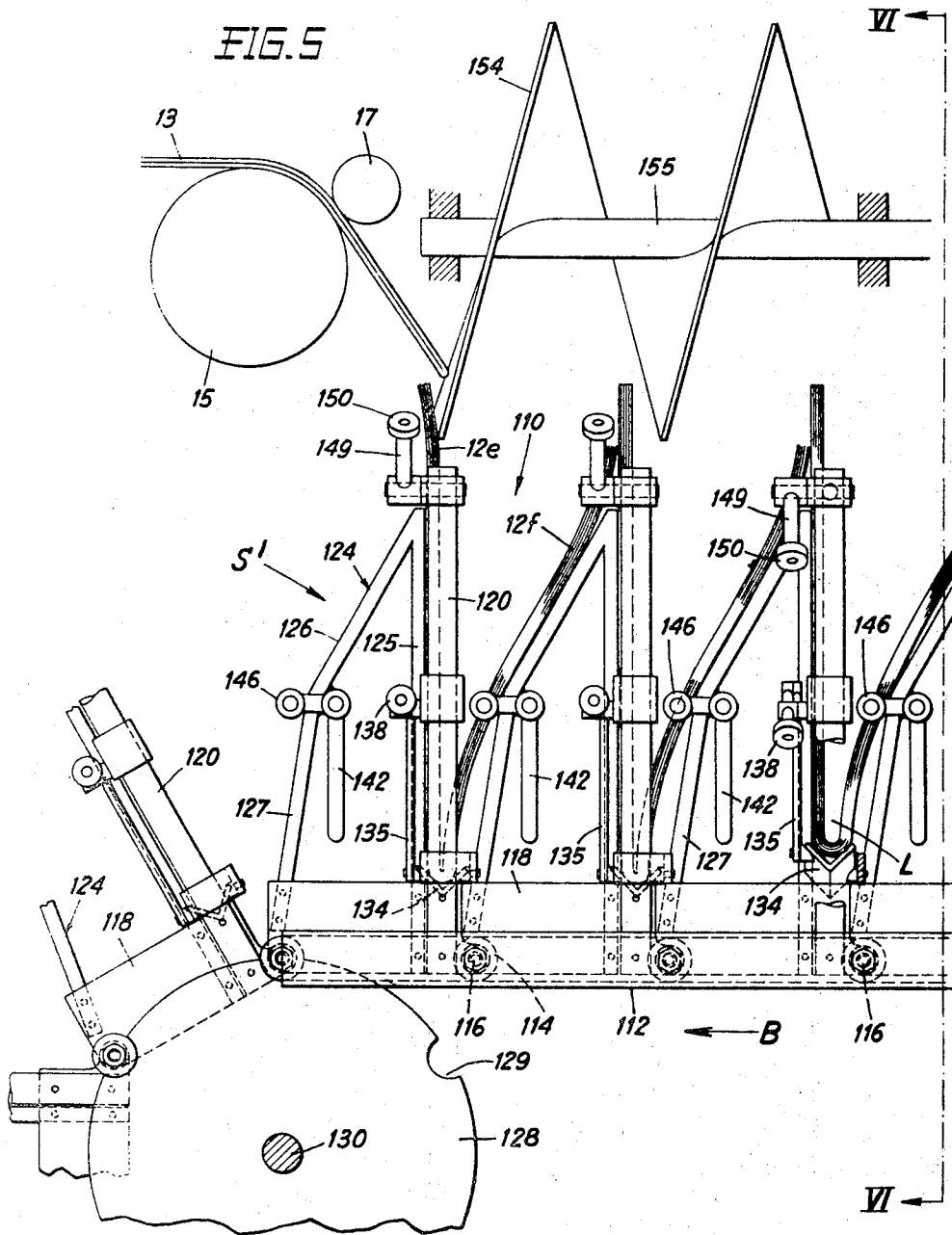
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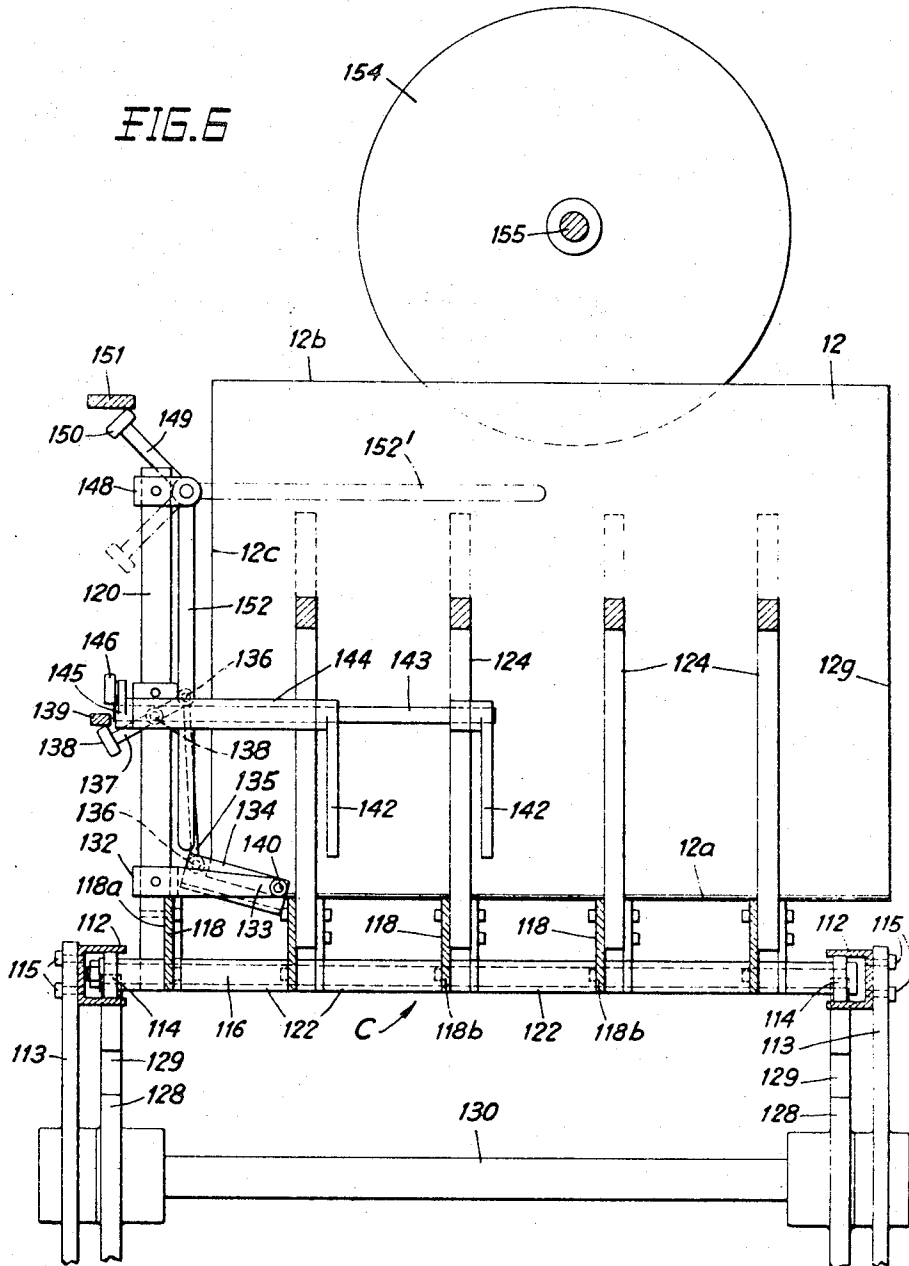


FIG. 6

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METHOD OF AND APPARATUS FOR STUFFING PRINTED MATTER WITH INSERTS

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U.S. Cl. 270—55

Int. Cl. B65h 5/30; 39/00

18 Claims

ABSTRACT OF THE DISCLOSURE

A method of, and apparatus for, stuffing printed material such as newspapers with at least one insert or supplement. The method contemplates forming a loop at one lateral open edge of the newspaper jacket section adjacent its transverse fold line, engaging the loop and continually enlarging the same until both jacket halves are completely separated from one another, thus resulting in the formation of a substantially V-shaped opening into which at least one supplement is inserted. The jacket halves are then closed about the inserted supplement(s) and the completed newspaper is passed on for other handling. The apparatus comprises means mounted for movement along a predetermined path of travel and which provide a plurality of compartments. Additionally, there is provided means for depositing a newspaper jacket section into each compartment, means for forming a loop at the newspaper jacket section within each compartment, means for engaging the loop in order to open the newspaper jacket section into two jacket halves, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

The present invention has reference to an improved method of, and apparatus for, stuffing printed material such as newspapers, pamphlets, catalogues, magazines, books, periodicals or the like with at least one insert or supplement. For convenience in description the invention will be described with reference to the stuffing of a newspaper section, which provides a jacket or cover, with at least one newspaper insert or supplement in order to provide a completed newspaper which can be conveniently handled and distributed. It is to be clearly understood, however, the term "newspaper" or "newspaper jacket section" or "newspaper insert" or "newspaper supplement," or any other term used herein which generally refers to "newspapers" is not intended to be used in a limiting sense, rather should be interpreted in its broadest sense as encompassing printed matter of any type and form which could be handled by the inventive apparatus and should be provided with at least one insert or supplement.

Modern printing presses possess a comparatively high hourly output, a fact which makes it necessary for any associated stuffing machine to be able to work at a speed equal to that of the rotary printing presses. Although numerous stuffing apparatuses are already known to the art, up to the present their operating speeds have generally not been able to reliably cope with the high speeds of the printing presses.

Accordingly, it is a primary object of the present invention to provide an improved method of, and apparatus for, quickly and reliably stuffing printed material with at least one insert.

A further, more specific object of this invention is to provide an improved method of, and apparatus for, stuffing printed matter with at least one insert in a very efficient manner and at a high rate of speed so that the

inventive apparatus can be used "in-line" with a high speed rotary printing press.

Another object of this invention is directed to the provision of an improved apparatus which opens newspaper jacket sections at their center and to opposite sides of a transverse fold line in a very quick and reliable manner.

Still a further object of this invention is to provide an improved apparatus for stuffing newspaper jacket sections with one or more supplements incorporating novel means which ensures that each such jacket section will be opened at its center.

One further object of this invention concerns itself with an improved construction of stuffing apparatus wherein opening of a newspaper jacket section which is to be stuffed with at least one supplement is effected by forming a loop at a lateral open end of the newspaper jacket section opposite its longitudinal fold edge and in the region of its transverse fold edge, to thereby enable separation of such newspaper jacket section at its center into two substantially equal jacket halves located to opposite sides of the aforementioned transverse fold edge.

Broadly speaking, the inventive method for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement, contemplates forming a loop at one lateral open edge of the newspaper jacket section adjacent its transverse fold line, so that the thus formed loop at least partially separates the newspaper jacket section at its center into two jacket halves. Thereafter, the loop is engaged and continually enlarged until both jacket halves are completely separated from one another to both sides of the aforementioned transverse fold line, thus resulting in the formation of a substantially V-shaped opening into which there is inserted at least one supplement. After insertion of the supplement or supplements, the jacket halves are again closed about the inserted supplement(s), whereby the latter is sandwiched between the now closed jacket halves so that the completed newspaper can be conveniently handled and distributed.

Insofar as the apparatus of the invention is concerned, such generally comprises means mounted for movement along a predetermined path of travel and which provide a plurality of compartments. Such compartment-providing means may be constructed as a rotor possessing the configuration of a star-like pocket wheel or can also be constructed in the form of an elongated endless, multiple-strand link chain. Additionally, there is provided means for depositing a newspaper jacket section into each compartment, means for forming a loop at the newspaper jacket section within each compartment, means for engaging said loop in order to open said newspaper jacket section into two jacket halves, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section. The details of the particular physical structure of the various components of the inventive apparatus providing the means for carrying out the various operational steps will be described in detail hereinafter.

Moreover, other features, objects and advantages of the invention will become apparent by reference to the following detailed description and drawings in which:

FIGURE 1 schematically illustrates a side view of a preferred embodiment of inventive stuffing apparatus with a portion of one side wall broken away in order to expose internal structure;

FIGURE 2 is a perspective view illustrating details of the various elements used for forming a loop and to open the newspaper jacket section at its center;

FIGURE 2a diagrammatically depicts the various cams which are used to operate the individual elements employed for forming the loop and opening the newspaper jacket section at its center;

FIGURE 3 is a perspective view, similar to FIGURE 2, yet showing the loop-forming element in a position where it has formed a loop at a newspaper jacket section located within a given compartment and the jacket opening element about to engage with the thus formed loop;

FIGURE 4 schematically illustrates in side view a portion of a variant form of stuffing apparatus constructed in the form of an elongated, endless, multiple-strand link chain provided with newspaper jacket section-receiving compartments and viewed from the region of the apparatus at which there is supplied the newspaper jacket sections;

FIGURE 5 schematically illustrates in side view the portion of the variant form of stuffing apparatus of FIGURE 4 viewed from the region of the apparatus at which there is supplied the inserts or supplements; and

FIGURE 6 is a cross-sectional view of the apparatus of FIGURE 5 taken along the line VI—VI thereof.

Prior to beginning a detailed description of the various embodiments of inventive apparatus for stuffing printed matter—hereinafter conveniently referred to as newspapers—with inserts or supplements, it is pointed out that only enough of the physical structure thereof has been shown in the drawings and will be described as believed necessary for one skilled in the art to clearly understand the underlying principles of the inventive concepts. Whenever certain auxiliary equipment not directly part of the subject invention is referred to in order to provide a better description of the apparatus, reference may be made to prior art clearly indicating that such components are well known and standard in the art.

Describing now the drawings and with particular attention initially directed to the exemplary embodiment of apparatus depicted in FIGURES 1 to 3 for opening newspaper serving as a cover or jacket—hereinafter designated newspaper jacket sections 12—and into which a supplement or insert section 13 is to be inserted, it will be recognized that at one end of the stuffing machine there is arranged a conventional open-ended hopper 10 into which there is placed a stack of the newspaper jacket sections 12. Each of these newspaper jacket sections 12 is composed of one or more newspaper pages or sheets folded along its or their longitudinal edge centrally of each sheet and then folded again transverse to such longitudinal edge, as indicated by the transverse fold line or edge 12a shown in FIGURE 2. The longitudinal edge of the depicted newspaper jacket section 12 is not visible in the drawing but would be opposite the lateral open edge 12c thereof. It is here pointed out that these newspaper jacket sections could be folded in the manner described in U.S. Patent No. 3,048,388, issued to E. K. Smith, Jr., et al., and granted Aug 7, 1962. These folded newspaper jacket sections 12 are placed in stacked formation in the hopper 10 such that when they are withdrawn one after the other therefrom and deposited in a stuffing device S provided with a plurality of pockets or compartments 24, which in the exemplary embodiment is constructed to partake the form of a star-like pocket wheel P, the transverse fold edge or line 12a is disposed at the lowermost region of the associated pocket 24 into which falls one such newspaper jacket section 12. Moreover, the upstanding lateral open or free edge 12c of this newspaper jacket section 12 located opposite the non-illustrated longitudinal fold edge, is situated closest to the various components which bring about opening of such newspaper jacket section 12 at its center.

Cooperating with the lower open end of the hopper 10 for the newspaper jacket sections 12 is any known mechanism which successively separates and removes one newspaper jacket section 12 after the other from the stack. Mechanism suitable for this purpose are well known to the art, and since the details thereof do not form part of the subject matter of this invention no further description of the particular physical structure involved will here be given. In fact, the aforementioned U.S. Patent No. 3,048,-

388 provides a teaching of possible mechanisms suitable for this purpose.

At any rate, after the lowermost newspaper jacket section 12 has been separated from the remainder of the stack it is fed between a driven transportation roller 14 preferably having a suitable vulcanized rubber coating thereon and a cooperating spring-loaded pressure or contact roller 16. These rollers 14, 16 cause such newspaper jacket section 12 to be deposited in a given pocket 24 of the star-shaped pocket wheel P. Considering now specific physical structure of this star-shaped pocket wheel, P, it will be recognized that it embodies a shaft member 18 which is continuously driven during the stuffing operation by a suitable non-illustrated drive mechanism, typically sprocket wheels and chain means. Mounted axially of and fixedly secured to the rotatable shaft member 18 are a number of discs 20. As best shown in FIGURE 2, the first disc 20a closest to the viewer carries the components employed for opening the newspaper jacket section 12 located in each associated pocket or compartment 24, whereas the remaining discs 20b are each provided with peripherally spaced slots 20c. A substantially U-shaped bracket or spoke 22 is fixed in each of these slots 20c and extends radially of the associated disc 20b in the form of a star. Naturally, the number of discs 20b which are mounted to the shaft 18 depends upon the width of the newspaper jacket sections as measured from the edge 12c to the opposite non-illustrated longitudinal edge and which should be handled by the machine.

It will also be recognized when looking axially along the shaft member 18 that the radially extending U-shaped brackets or spokes 22 are arranged in neighboring rows extending circumferentially about the disc members 20b. Specifically, the U-shaped brackets or spokes 22 of one row cooperate with the U-shaped brackets of a neighboring row to form the respective radially extending compartments or pockets 24 into each of which there is inserted a single newspaper jacket section 12. Moreover, each U-shaped bracket or spoke 22 incorporates a pair of parallel, spaced, confronting legs 22a (only one of which is visible in FIGURE 2) which extends forwardly of an intermediate web portion 22b in the direction of rotation A of the star-like pocket wheel P. Furthermore, the outer portions of these parallel legs 22a are advantageously curved, as indicated at 22c, in the aforementioned direction of rotation. These curved portions 22c of the parallel legs 22a tend to urge the inserted newspaper jacket section 12 towards the respective oppositely situated straight web portions 22b of the leading row of bracket members 22 of the corresponding pocket or compartment 24.

To ensure that each newspaper jacket section 12 upon receipt in a given compartment or pocket 24 contacts against the leading row of spokes or bracket members 22 of such pocket 24 there is advantageously provided a perforated blower pipe or conduit 26 (FIGURE 1) communicating with a supply pipe 27 leading to a suitable source of compressed air, so that an air stream 25 will impinge against the back face 12d of the relevant newspaper jacket section to force such flush against the leading row of bracket members or spokes 22. It will also be recognized by referring to FIGURE 2, that the disc member 20b closest the outermost disc member 20a has each of its bracket members or spokes 22 carrying an angle piece 28 having one leg 28a bearing snugly against a confronting leg 22a of the associated bracket member 22. The other leg 28b of this angle piece 28 provides a backing support for a tubular hold-down or press-on bar or rail 30. This press-on or hold-down bar or rail 30 is capable of bearing against the back face 12d of the newspaper jacket section 12 in the associated pocket 24, specifically in the vicinity of the lateral open end 12c of such newspaper jacket section 12. This pressing action of the hold-down rail 30 urges and keeps such newspaper jacket section 12, at least at the region near the lateral open end

12c thereof, snugly against leg 28b forming a portion of the leading wall of the relevant pocket 24. This restraining jacket section 12 enables the mechanism for forming an elongated loop L (FIGURE 3) at the lower end of such newspaper jacket section 12 to operate properly. This mechanism will be considered in detail shortly.

It will be further recognized that the press-on or hold-down rail 30 is articulated at 32, intermediate its ends, to an arm 34 of a clamp member 36 which is fixedly clamped by means of suitable fastening members 38 to a shaft member 40 which piercingly projects through a radially extending carrier or support 42 connected to the disc member 20a by means of bolts 44 or equivalent structure. Near the end of the rotatable shaft member 40 remote from the hold-down rail 30 there is fixedly mounted a plate-like member 46 provided with a nose portion 48, shown to extend axially and substantially parallel to the shaft member 40. Additionally, a lever member 50 provided with a radially extending nose 52 is mounted to be freely rotatable upon the end of the shaft member 40 and is held thereon by means of a suitable retaining clamp 54. It will be recognized that the members 46 and 50 are spaced axially of the shaft 40 and intermediate them there is arranged a spirally-wound spring 56 having one end 57 bearing against the nose portion 48 and the other end 58 engaging in an appropriate opening or hole 59 formed at the freely rotatable lever member 50. This spiral spring 56 is wound such that the nose members 48 and 52 normally abut one another, and the hold-down or press-on rail 30 is normally spaced from the angle piece 28 so that the pocket 24 is in a condition to receive a newspaper jacket section 12.

In order to properly urge the press-on rail 30 against the back face 12d of the newspaper jacket section 12 located in an associated pocket 24, the freely mounted lever 50 is provided at one end with a cam follower 60 which cooperates with a suitably designed cam disc 62 provided with a closed cam follower slot 61 (FIGURES 2 and 2a). This cam follower slot 61 is designed to provide a cam surface 61a which urges the cam follower 60 downwards after a newspaper jacket section 12 has been deposited in an associated pocket 24, whereby the spring 56 is tensioned such that the nose member 48 and the shaft 40 are rotated in clockwise direction in FIGURE 2, and the hold-down rail 30 urged against the newspaper jacket section 12. The provision of the spring 56 and the pivotable mounting of the hold-down rail 30 enables the latter to work properly even when different thicknesses of newspaper jacket sections 12 are processed. At such time as it is desired to remove the hold-down rail 30 from contact with the newspaper jacket section 12, and as will be considered shortly, the cam follower 60 rides upon a further cam surface 61b of the cam follower slot 61, whereby the lever member 50 is rotated in counterclockwise direction so that its nose 52 abuts against the nose 48. When this happens, the shaft member 40 is also rotated in counterclockwise direction and the arm 34 pulls the hold-down rail 30 away from the newspaper jacket section 12.

It will be also seen that at the lower end of the angle piece 28 there is provided a bearing block 64 pivotably supporting a bell crank or double-arm lever 66. One leg 67 of this bell crank 66 carries a roller member 68, preferably provided with a rubber sheating 69, and disposed at the lower region of the inserted newspaper jacket section 12 beneath its transverse fold line 12a and towards the outermost extremity thereof in the region of the lateral open edge 12c. This roller 68 which is situated between the disc member 20a and the neighboring spaced disc 20b can be rocked upwards so that it is able to push from beneath against such transverse fold line 12a in order to form an elongated loop L, best shown in FIGURE 3, which at least partially separates the two jacket halves 12e and 12f at the central region of the newspaper jacket section 12 and to both sides of the transverse fold line 12a.

Now, in order to be able to upwardly rock the loop-forming roller member 68 the other leg 69 of the double-arm lever or bell crank 66 is operatively connected, at 70, with a rod member 71 having one end 72 piercingly extending through an oblong slot 73 provided at the disc member 20a. This one end 72 of the rod 71 is articulated, at 74, to a downwardly depending lug 75 carried by a cylindrical sleeve member 76 pivotably mounted in a U-shaped bracket 77 connected with the upright support or carrier 42, specifically at the lower region thereof. The cylindrical sleeve 76 carries a laterally extending rod member 78, at the free end of which there is mounted a cam follower 79 cooperating with a cam disc 80 provided with a closed cam follower slot 81. It should thus be evident, when the cam follower 79 rides upon the ascending cam surface 80a (FIGURE 2) of the cam follower slot 81 the downwardly depending lug 75 is rocked in counterclockwise direction in FIGURE 2, to thereby pull the rod member 71 to the left, and to thus upwardly displace the loop-forming roller 68 against the outer region of the fold line or edge 12a of the newspaper jacket section 12, so that the previously mentioned loop L is formed, specifically at the center of such jacket section 12. In other words, this roller 68 forms a loop L at the associated newspaper jacket section 12 which divides the latter centrally of the entire stack of pages or sheets forming such newspaper jacket section. It will also be appreciated that during such time as the loop-forming roller 68 is upwardly displaced against the transverse fold line 12a, the hold-down rail 30 presses against the back face 12d of this newspaper jacket section 12. It is also here pointed out that the hold-down rail 30 mounted to the shaft 40 carried by the support 42 trailing the support 42 which carries the cam follower 79 operating the loop-forming roller 68 acting upon the newspaper jacket section 12 in a given compartment or pocket 24 is the one which engages with the back face 12d of this newspaper jacket section 12.

Mechanism is also provided for engaging with the formed loop L in order to completely open the newspaper jacket section 12, in other words, to separate such into two jacket halves 12e and 12f at opposite sides of the transverse fold line 12a. Such mechanism embodies a substantially triangular-shaped, preferably lightweight newspaper opening member 82 tapering at its lower end into a finger-like projection 83 capable of moving towards and into the loop L, as generally shown in FIGURE 3. It will be seen that the upper end of this triangular-shaped newspaper opening member 82 is provided with a substantially U-shaped clamping portion 84 which can be fixedly clamped by fastening bolts 85 or equivalent structure about a shaft member 86 piercingly extending through a hollow sleeve portion 43 of the upright carrier or support 42. The other end of the shaft member 86 remote from the clamping portion 84 is provided with an enlarged head 87 carrying a radially extending rod member 88, at the free end of which there is mounted a cam follower 89 cooperating with the cam follower slot 90 of a cam plate 91. It should be thus apparent, that in order for the finger-like portion 83 of the newspaper opening member 82 to be moved into the loop L the cam follower 89 must bear against the descending cam surface 90a, whereby this cam follower 89 is moved downwardly in FIGURE 2, to thus rotate the shaft member 86 in counterclockwise direction, thereby also the newspaper opening member 82, this resulting in the finger-like projection 83 moving into the loop L. The cam surface 90a of the cam follower slot 90 is designed such that the finger-like projection 83 is rotated substantially through about 90°, in other words, moves upwards from the region of the transverse fold line 12a towards the opposite upper edge 12b of the associated newspaper jacket section 12. However, in order for such finger-like projection 83 to be able to move upwardly towards this edge 12b, then, after the loop L has been formed and the finger-like projection 83 has just moved into this loop,

the hold-down rail 30 must also move out of contact with the back face 12*d* of the newspaper jacket section 12. This is accomplished due to properly designing and positioning the cam follower slot 61 cooperating with the cam follower 60.

After the finger-like projection 83 has moved upwards, that is towards the upper end 12*b* of the newspaper jacket section 12, the latter is divided into two jacket halves 12*e* and 12*f* at both sides of the transverse fold line 12*a*, so that this newspaper jacket section now possesses a substantially V-shaped opening. In order to maintain such newspaper jacket section 12 in open condition, i.e. to keep the two jacket halves 12*e*, 12*f* separated from one another until after at least one insert or supplement 13 has been deposited therebetween, it will be seen by referring to FIGURE 1 that a spiral or worm member 93 is rotatably mounted upon a shaft member 94 carried at a bracket 95 supported at a standard 96 attached to the frame of the machine. This spiral or worm 93 is driven by a suitable bevel gear arrangement 97 or otherwise, wherein the speed of rotation of the spiral 93 and its pitch is selected in accordance with the rotational speed of the pocket wheel P. The purpose of the spiral 93 is to engage with the trailing jacket half 12*f* of the opened newspaper jacket section 12 and to keep such open, in other words separated from the leading jacket half 12*e* until such time as at least one insert or supplement 13, arranged in stack formation in a further hopper 11, is deposited into the opened newspaper jacket section 12.

By referring to FIGURE 1 it will be recognized that at the left end of the machine there is disposed this hopper 11 which contains the insert sections or supplements 13 and with which cooperates a driven transportation roller 15 and a cooperating spring-loaded pressure roller 17. It is to be appreciated that the rollers 15 and 17 may be similar to the rollers 14 and 16 respectively, associated with the hopper 10 located at the other end of the machine and which supports the stack of newspaper jacket sections 12. Furthermore, the same mechanism used for the hopper 10 for separating the individual newspaper jacket sections 12 from one another can also be used for the hopper 11 for the inserts 13.

At this point it is also indicated that at such time as the spiral 93 engages with the trailing jacket portion or half 12*f* of the open newspaper jacket section 12, the newspaper opening member 82 is returned into its starting position since the cam follower slot 90 is appropriately configured and positioned for this purpose. After the insert section or supplement 13 has been deposited into the open newspaper jacket section 12 the trailing jacket half 12*f* no longer engages with the spiral 93 due to the continuous rotation of the pocket wheel P in the direction of the arrow A, such trailing jacket half then falling onto the inserted supplement 13 to sandwich such within the newspaper jacket section 12 and, thereby to form the completed newspaper—assuming of course that only one supplement 13 is to be inserted. The pocket wheel P then continues to rotate, finally arriving at a removal location R incorporating transport or conveyor means 98 (FIGURE 1) which may be in the form of a plurality of spaced conveyor belts 99, each of which extends between two neighboring spokes 22 of a row of such spokes. The thus stuffed newspapers fall onto the conveyor means 98 and are then transferred to an appropriate station where they may be further processed or removed. In order to facilitate removal of the stuffed newspapers from the associated pockets 24 there is additionally advantageously provided an ejector mechanism E (FIGURE 1) incorporating a plurality of ejector rods 100 (only one of which is visible in FIGURE 1) which engage behind the transverse fold line 12*a* an assist in pushing each completed newspaper containing the insert 13 from its pocket 24. The ejector rods 100 are here shown driven by a suitable sprocket and chain drive 101 at a speed correlated to the operating speed of the rotating pocket wheel P. It is also here mentioned that the mechanism for feeding the newspaper jacket sec-

tions 12 and the mechanism for feeding the supplements 13 are adjusted as regards their feeding operation in accordance with the rotational speed of the pocket wheel P.

Finally, it is to be appreciated that each pocket 24 of the pocket wheel P has associated therewith a hold-down rail 30, a loop-forming roller member 68 and associated operating mechanism, as well as a newspaper opening member 82 and its associated operating mechanism. Quite obviously, the various cams previously described are not only appropriately designed, but are also positioned in such a manner, that the various operations occur in the desired sequence. Specifically, it is to be noted that initially the hold-down rail 30 presses the closed newspaper jacket section 12 snugly against the leading portion of the associated pocket 24, thereafter the roller member 68 forms the loop L, and then the finger-like projection 83 of the newspaper opening member 82 moves into the formed loop L, at which time then the hold-down rail 30 moves away from such newspaper jacket section so that this finger-like projection 83 can move unobstructedly upwards throughout substantially the height of this newspaper jacket section 12. Thereafter, in other words when this newspaper jacket section is opened, the spiral 93 engages with the trailing half 12*f* thereof until such time as the insert 13 is deposited therein. It will also be recognized that all of these operations occur during such time as each pocket 24 moves from a location at the right of the machine of FIGURE 1, where a newspaper jacket section 12 is deposited into such pocket, towards the left of the machine where the insert or supplement 13 is received from the hopper 11.

Having now had an opportunity to consider in considerable detail the physical structure of a preferred embodiment of inventive apparatus for successively opening a series of newspaper jacket sections and inserting at least one insert section or supplement into each opened newspaper jacket section, the manner of operation of the heretofore described apparatus will now be considered in detail: It will be understood that during operation of the inventive apparatus the pocket wheel P continuously rotates at a desired rotational speed, so that each pocket or compartment 24 moves past the station at which a newspaper jacket section 12 is fed into each such pocket 24. After the newspaper jacket section 12 has been deposited in its pocket 24 the blower means 26 blows a jet of air 25 against the back face 12*d* of such newspaper jacket section 12, so that it is urged against the leading bracket members or spokes 22 of this pocket 24. While the pocket wheel P continues rotating in the direction of the arrow A the cam follower 60 is acted upon by the associated cam disc 62 in such a manner that the hold-down rail 30 is urged against the back face 12*d* of the newspaper jacket section 12 at the region of the forwardmost portion visible in FIGURE 2, whereby at least this forwardmost portion of the newspaper jacket section 12 is snugly held against the angle piece 28. Thereafter, the cam follower 79 rides upon the cam surface 80*a* of the cam disc 80 so that the loop-forming roller 68 is pivoted from below upwards against the transverse fold edge or line 12*a* of the newspaper jacket section 12, to thus form the loop L. After this loop L has been formed the cam follower 89 is acted upon by the cam surface 90*a* of the cam disc 91 in a manner to rock the newspaper opening member 82 towards the newspaper jacket section 12, whereby the finger-like projection 83 enters the loop L and then the hold-down rail 30 is moved by the cam follower 60 cooperating with the cam follower slot 61 away from the newspaper jacket section 12. Consequently, the upwardly rocking finger-like projection 83 can move unobstructedly through the center of the newspaper jacket section 12 and thus completely divides the latter into two jacket halves 12*e*, 12*f*. The trailing jacket half 12*f* of the newspaper jacket section 12 is then engaged by the spiral 93, so that it is kept open until the corresponding pocket 24 reaches the location of the hop-

per 11. At this region at least one insert section or supplement 13 is fed into the opened newspaper jacket section 12, whereafter the spiral 93 comes out of engagement with the trailing jacket half 12f of the opened newspaper jacket section 12 to allow such to again close under its own weight and due to the fact that this pocket 24 is now rotating downwardly towards the discharge conveyor means 98. When the relevant pocket 24 with the therein inserted newspaper jacket section 12, which has now been stuffed with the insert 13, is disposed in the vicinity of and somewhat above the conveyor means 98 the rod-like ejectors 160 act against the transverse fold line or edge 12a to thus eject the newspaper jacket section 12 and its insert 13 out of its pocket 24 onto the conveyor means 98 for removal to any desired location.

In the variant embodiment of inventive apparatus for stuffing newspapers, periodicals, or the like as it appears in FIGURES 4-6, the stuffing device S' is not formed in the shape of a star-like pocket wheel, rather partakes the form of a multiple-strand conveyor link chain C provided with the pockets or compartments 110 for receiving the newspaper jacket sections 12. To simplify the description the same reference characters have been generally used for elements similar to those which appear in the previous embodiment. Thus, by referring to FIGURE 4 depicting the infeed end of the inventive apparatus, it will be recognized that the newspaper jacket sections 12 are again delivered from between a driven transportation roller 14 advantageously provided with a vulcanized rubber coating on its surface and the cooperating spring-loaded pressure roller 16, into a pocket 110 of the stuffing device which, in this instance, is in the form of an elongated, endless conveyor-like multiple-strand link chain C. These newspaper jacket sections 12 are received from a non-illustrated delivery hopper which can be assumed to be similar to the hopper 10 of FIGURE 1, and for such reason not here illustrated.

As best seen by referring to FIGURE 6, here the stuffing device S' comprises a pair of confronting, parallel and spaced U-shaped rail members 112 affixed to the side plates 113 of the machine by bolts 115 and which provide track means for a plurality of roller elements 114. Each roller element 114 riding on one U-shaped rail 112 and the oppositely situated roller 114 riding on the other U-shaped rail 112 are operatively interconnected by means of a shaft member or axle 116. Each two neighboring axles or shafts 116 are interconnected by links or plates 118 axially spaced along these shafts 116 (FIGURE 6). By virtue of this physical structure the stuffing device S' assumes the form of a multiple-strand link chain arrangement C.

It will also be noticed that each of the first links or plates, generally designated 118a in FIGURE 6, has connected thereto an upright support or standard 120. Standard 120 carries the mechanism, to be described hereinafter, for holding the inserted newspaper jacket section 12 against the front wall of the relevant compartment or pocket 110, the mechanism for forming the loop L at the lower end of the inserted newspaper jacket section 12, and the mechanism for opening the newspaper jacket section into two jacket halves 12e, 12f. Spaced axially of the link or plate 118a are the further links, identified by reference character 118b, with each such links or plates 118b being spaced from one another and the first link 118a by means of spacer sleeves 122 which are slipped onto the corresponding shaft 116. To each such link or plate 118b there is fixedly mounted a substantially V-shaped strut or angle iron 124 which comprises a vertical flat leg 125 which merges at its upper end with a downwardly extending leg 126 terminating in a portion 127 which is slightly inclined with respect to the vertical. It will be recognized that the forward leg portions 126, 127 of each of the angle irons 124 mounted to the links 118b arranged in one row across the shaft 116 together with the flat vertical legs 125 of the angle irons 124 arranged

at a leading row form a respective pocket 110 into which is inserted a newspaper jacket section 12. The described arrangement of the spaced rows of angle irons 124 is continuous along the entire endless multiple-strand link chain C of this embodiment, as will be clearly recognized by referring to FIGURES 4-6.

Now, in order to advance the pockets 110, after a newspaper jacket section 12 has been inserted, towards the station at the other end of the machine where the insert sections or supplements 13 are introduced into the opened newspaper jacket sections 12, it will clearly be seen by referring to FIGURES 4 and 5 that drive means in the form of sprocket wheels 128 are arranged at each end of the U-shaped rails 112. Spaced about the periphery of each sprocket wheel 128 are a plurality of substantially semi-circular grooves 129 capable of engaging with the previously described rollers 114 as such leave the U-shaped rails 112, in order to continuously propel the entire stuffing device S' from the station where the newspaper jacket sections 12 are deposited into the pockets 110 to the station where the insert sections or supplements 13 are delivered from between the driven transportation roller 15 and the cooperating spring-loaded pressure roller 17 into the opened newspaper jacket section 12 contained in a pocket 110 moving beneath such last mentioned station. These driving sprocket wheels 128 are mounted upon a respective rotatable shaft 130, are driven by suitable sprocket and chain means for instance, and in accordance with the operating speed for the infeed of the newspaper jacket sections 12 and the inert sections or supplements 13.

As previously mentioned, each of the upright supports or standards 120 carries the various mechanism required for opening the newspaper jacket sections 12. Specifically, by inspecting FIGURE 6 it will be recognized that each such upright support 120 has affixed at its lower end a bracket 132, and at its free end 133 is articulated with a V-shaped angle plate 134 used for forming the loop L at the outermost extremity of the transverse fold line 12a of the newspaper jacket section 12. This angle plate 134 corresponds in function to the loop-forming roller member 68 of the previous embodiment. So as to be able to pivot this angle plate 134 to form the required loop L at the newspaper jacket section 12 a rod member 135 is articulated, at 136, to the outermost end of such angle plate 134. Rod member 135 is pivotably connected at its upper end 136 to a lever 137 mounted to pivot about a fulcrum 138. The lever 137 carries a cam follower 138 at its free end which cooperates with a cam 139 in such a manner that when the cam follower 138 is urged downwardly by this cam follower 139, the lever 137 pivots in counterclockwise direction in FIGURE 6, thereby pulling the rod 135 upwards to thus cause the angle plate 134 to pivot upwards in clockwise direction about its pivot point 140. This upward movement of the angle plate 134 results in the required formation of the loop L at the newspaper jacket section 12 located in the associated pocket 110.

Means is also provided for urging at least the lower region of the newspaper jacket section 12 after it is deposited in its pocket 110 against the lower portion of the flat upright leading wall of the relevant pocket 110 formed by the back faces of the vertical legs 125 of the struts or angle irons 124. In the exemplary embodiment here illustrated, such means comprises a pair of hold-down or press-on rails 142 which are operatively connected via a shaft member 143 with a sleeve 144 carrying a cam follower 146 at its outermost end 145. This cam follower 146 cooperates with a suitable non-illustrated cam which, at the appropriate time and after the newspaper jacket section 12 has been deposited in its pocket 110, rocks the hold-down or press-on rails 142 in clockwise direction of FIGURE 4 against the lower portion of the newspaper jacket section 12, to urge such against the leading wall of its pocket 110. It should be appreciated that the hold-down rails 142 are similar in

their function to the angle hold-down rail 30 of the embodiment disclosed and discussed in conjunction with FIGURES 1-3. Once again, it is pointed out that the hold-down rails 142 first press against the lower extremity of the newspaper jacket section 12 and thereafter the angle plate 134 is raised to form the loop L. It is also indicated that due to the angular disposition of the leg portions 126, 127 of the angle irons 124 the newspaper jacket section 12 deposited in each pocket 110 has the tendency to lean rearwardly opposite the direction of travel of the stuffing device S' indicated by the arrow B in FIGURES 4 and 5.

Also in this embodiment mechanism is provided for completely opening the newspaper jacket section 12 into two jacket halves 12e, 12f. To this end, it will be noticed that at the upper region of each upright support or standard 120 there is mounted a bracket 148 to which there is pivotably mounted a rod 149 carrying a cam follower 150 cooperating with a cam 151. The end of the rod 149 remote from the cam follower 150 is articulated with a normally downwardly depending lever 152 capable of moving into the loop L formed at the lateral open edge 12c of the newspaper jacket section 12 opposite the longitudinal edge 12g and then moves upwards into the phantom line position 152' of FIGURE 6. Due to such movement it completely opens and separates this newspaper jacket section 12 into two jacket halves 12e, 12f. Here again, it should be apparent that the jacket opening-lever 152 corresponds in function to the newspaper opening member 82 of the previous embodiment of FIGURES 1-3. Similar to the previous embodiment, during such time as the newspaper opening-lever 152 moves into the formed loop L, the hold-down rails 142 are again moved out of contact with the back surface or face of the newspaper jacket section 12 due to appropriate configuration of the cam cooperating with the cam follower 146.

As best seen by referring to FIGURE 5, after the newspaper opening-lever 152 has opened the newspaper jacket section 12 the stuffing device S' moves towards the operating region of a spiral or worm 154, similar to the spiral 93 of the previous embodiment, and mounted for rotation upon a shaft 155. This spiral 154 ensures that the now open newspaper jacket section 12 remains open until the insert section or supplement 13 coming from between the rollers 15, 17 is deposited into the relevant pocket 110 and between the open halves 12e, 12f of the therein contained newspaper jacket section 12. It also will be apparent by referring to FIGURE 5 that the spiral 154 keeps the leading half 12e of the newspaper jacket section 12 separated from its trailing half 12f until deposition of the insert or supplement 13 between these two halves. After the insert or supplement 13 has been properly lodged between the jacket halves 12e, 12f the continuously moving pockets 110, particularly the pocket containing the newspaper jacket section 12 and the therein inserted supplement 13, moves out of the operating range of the spiral 154 and is further conveyed by the drive sprocket wheels 128 to a non-illustrated station, whereat the thus processed newspaper jacket section 12 and its inserted supplement 13 are removed from the corresponding pocket 110.

It is to be clearly understood that the sequence of operations of the hold-down rails 142, the loop-forming angle plate 134 and the newspaper opening-lever 152 are similar to that previously described. Moreover, the speed of operation of the driving sprocket wheels 128, the infeed of the newspaper jacket sections 12 and the inserts or supplements 13 are properly correlated to one another, as is the speed of rotation as well as also the pitch of the spiral 154.

While the invention has been described by way of illustration in conjunction with the processing of newspapers, it is again mentioned that it should be clearly understood and quite apparent that its possible uses are not solely limited to newspaper since it is equally capable of stuffing periodicals, magazines, books, and, in fact, most any other type of printed matter where normally at least one or even

possibly more supplements are desired to be inserted. Accordingly, it is again stressed that the term "newspaper" or "newspaper jacket section" or similar terms are used herein in their broadest sense and are in no way to be interpreted as limiting the application of the machine only to be the stuffing of newspapers.

While there is shown and described present preferred embodiments of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practised within the scope of the following claims.

What is claimed is:

1. Method for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections having a transverse folded edge and an adjacent lateral open edge with at least one supplement, comprising the steps of exerting a holding force at the newspaper jacket section to force and hold it against a support surface in order to restrain its movement, exerting a pressing force from externally of and directly against said transverse fold line at the region adjacent said lateral open edge of said newspaper jacket section, to thereby form a loop which partially separates said newspaper jacket section into two equal jacket halves lying at opposite sides of said transverse fold line, thereafter engaging said loop while removing the holding force and continually enlarging the size of said loop to thus completely separate said two jacket halves from one another to define a substantially V-shaped opening, then inserting at least one supplement into said V-shaped opening, and thereafter closing said jacket halves about the inserted supplement to thus sandwich said supplement between said jacket halves.

2. Method for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections having a transverse folded edge and an adjacent lateral open edge with at least one supplement, comprising the steps of exerting a holding force at the newspaper jacket section to force and hold it against a support surface in order to restrain its movement, exerting a pressing force from externally of and directly against said transverse fold line at the region adjacent said lateral open edge of said newspaper jacket section, to thereby form a loop which partially separates said newspaper jacket section into two equal jacket halves lying at opposite sides of said transverse fold line, thereafter engaging said loop while removing the holding force and continually enlarging the size of said loop to thus completely separate said two jacket halves from one another to define a substantially V-shaped opening, maintaining said jacket halves separated from one another, then inserting at least one supplement into said V-shaped opening, and thereafter closing said jacket halves about the inserted supplement to this sandwich said supplement between said jacket halves.

3. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement, comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a newspaper jacket section into each compartment; means for restraining said newspaper jacket section in said compartment, means for forming a loop at the newspaper jacket section within each compartment, said loop-forming means comprising means for pressing directly against a transverse fold line of said newspaper jacket section, means for engaging with said loop in order to open said newspaper jacket section into two jacket halves, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

4. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a newspaper jacket section into each compartment, each compartment including a leading wall portion and a trailing

wall portion with respect to the direction of movement of said compartment-providing means, means for pressing each newspaper jacket section against the leading wall of its compartment, means for forming a loop at the newspaper jacket section within each compartment, said loop-forming means comprising means for pressing directly against a transverse fold line of said newspaper jacket section, means for engaging with said loop for opening said newspaper jacket section into two jacket halves, means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

5. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, said compartment-providing means comprising a rotatable shaft member, a plurality of disc members spaced from one another axially along said shaft member, a plurality of substantially radially extending spokes circumferentially spaced about and affixed to each disc member; means for depositing a newspaper jacket section into each compartment; each compartment including a leading wall portion and a trailing wall portion with respect to the direction of movement of said compartment-providing means; means for pressing each newspaper jacket section against the leading wall of its compartment; means for forming a loop at the newspaper jacket section within each compartment; means for engaging with said loop for opening said newspaper jacket section into two jacket halves; means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween; and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

6. Apparatus as defined in claim 4, further including means for ejecting each newspaper jacket section which has been stuffed with at least one supplement from its compartment, and means for receiving the ejected newspaper jacket section together with its supplement for transporting the same to a given location.

7. Apparatus as defined in claim 4, wherein said pressing means comprises a rotatably mounted shaft member extending into each compartment, a press-on rail pivotably mounted at each rotatably mounted shaft member in a position to act upon the back face of the newspaper jacket section located within the associated compartment, and means for urging said press-on rail towards and away from said back face of said newspaper jacket section.

8. Apparatus as defined in claim 7, wherein said urging means comprises a cam follower operatively connected with said shaft member, and cam means cooperating with said cam follower, said cam means including cam surface means positioned and designed to urge said press-on rail against said back face of the newspaper jacket section prior to the formation of said loop, and to withdraw said press-on rail away from said back face of the newspaper jacket section after said loop-engaging means has entered said loop.

9. Apparatus as defined in claim 4 wherein said loop-engaging means comprises a pivotably mounted member provided for each compartment, said pivotably mounted member including a depending finger-like projection capable of moving into the loop formed at the newspaper jacket section located within the associated compartment, and means for displacing said pivotably mounted member after said loop is formed so that said finger-like projection engages with said loop and effects opening of said newspaper jacket section into two jacket halves.

10. Apparatus as defined in claim 9, said displacing means for said pivotably mounted member comprising a cam follower operatively connected with said pivotably mounted member, cam means cooperating with said cam follower for causing said finger-like projection to move into said loop.

11. Apparatus as defined in claim 4 wherein said compartment-providing means is defined by an endless, elongated member constructed in the form of a multiple-strand link chain, roller means carried by said elongated member, track means upon which said roller means ride, a plurality of spaced radially extending spokes arranged in rows and carried by said multiple-strand link chain, each two neighboring rows of spokes defining a respective compartment for receiving a newspaper jacket section.

12. Apparatus as defined in claim 11 further including means for driving said endless, elongated member along said predetermined path of travel.

13. Apparatus as defined in claim 12 wherein said driving means comprises sprocket wheel means provided with a plurality of substantially semi-circular grooves peripherally spaced about said sprocket wheel means and engageable with said roller means.

14. Apparatus for stuffing printing matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a newspaper jacket section into each compartment, each compartment including a leading wall portion and a trailing wall portion with respect to the direction of movement of said compartment-providing means, blower means for forcing each newspaper jacket section after it is deposited into its compartment against said leading wall portion thereof, means for forming a loop at the newspaper jacket section within each compartment, means for engaging with said loop for opening said newspaper jacket section into two jacket halves, means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

15. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a newspaper jacket section into each compartment, each compartment including a leading wall portion and a trailing wall portion with respect to the direction of movement of said compartment-providing means, means for pressing each newspaper jacket section against the leading wall of its compartment, means for forming a loop at the newspaper jacket section within each compartment, said loop-forming means comprising a pivotably mounted bell crank arranged at the lower end of each compartment in the region beneath and adjacent one lateral edge of the newspaper jacket section when located within the corresponding compartment, a roller member carried by said bell crank capable of contacting a transverse fold line of said newspaper jacket section, and means for displacing said roller member against said transverse fold line to thus form a loop in the region of said one lateral edge of said newspaper jacket section, means for engaging with said loop for opening said newspaper jacket section into two jacket halves, means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

16. Apparatus as defined in claim 15 wherein said displacing means for said roller member comprises a cam follower operatively connected with said bell crank, a cam cooperating with said cam follower, said cam including a cam surface positioned and designed to effect contact of said roller member with said transverse fold line prior to said loop-engaging means entering said loop.

17. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a

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newspaper jacket section into each compartment, each compartment including a leading wall portion and a trailing wall portion with respect to the direction of movement of said compartment-providing means, means for pressing each newspaper jacket section against the leading wall of its compartment, means for forming a loop at the newspaper jacket section within each compartment, means for engaging with said loop for opening said newspaper jacket section into two jacket halves, means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween, said means for keeping said two jacket halves separated from one another comprising a rotatably mounted spiral positioned to move into the opening formed between the separated jacket halves, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

18. Apparatus for stuffing printed matter with inserts, particularly for stuffing newspaper jacket sections with at least one supplement comprising means mounted for movement along a predetermined path of travel providing a plurality of compartments, means for depositing a newspaper jacket section into each compartment, each compartment including a leading wall portion and a trailing wall portion with respect to the direction of movement of said compartment-providing means, means for pressing each newspaper jacket section against the leading

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wall of its compartment, means for forming a loop at the newspaper jacket section within each compartment, said loop-forming means comprising a pivotably mounted angle plate arranged at the lower end of each compartment in the region beneath and adjacent one lateral edge of the newspaper jacket section when located within the corresponding compartment, and means for displacing said angle plate against a transverse fold line of the newspaper jacket section to thus form a loop in the region of said one lateral edge thereof, means for engaging with said loop for opening said newspaper jacket into two jacket halves, means for keeping said two jacket halves separated from one another until at least one supplement is inserted therebetween, and means for depositing at least one supplement between the separated jacket halves of each newspaper jacket section.

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