

Aug. 7, 1962

E. K. SMITH, JR., ET AL

3,048,388

NEWSPAPER STUFFING MACHINE

Filed July 17, 1959

16 Sheets-Sheet 1

FIG. 1

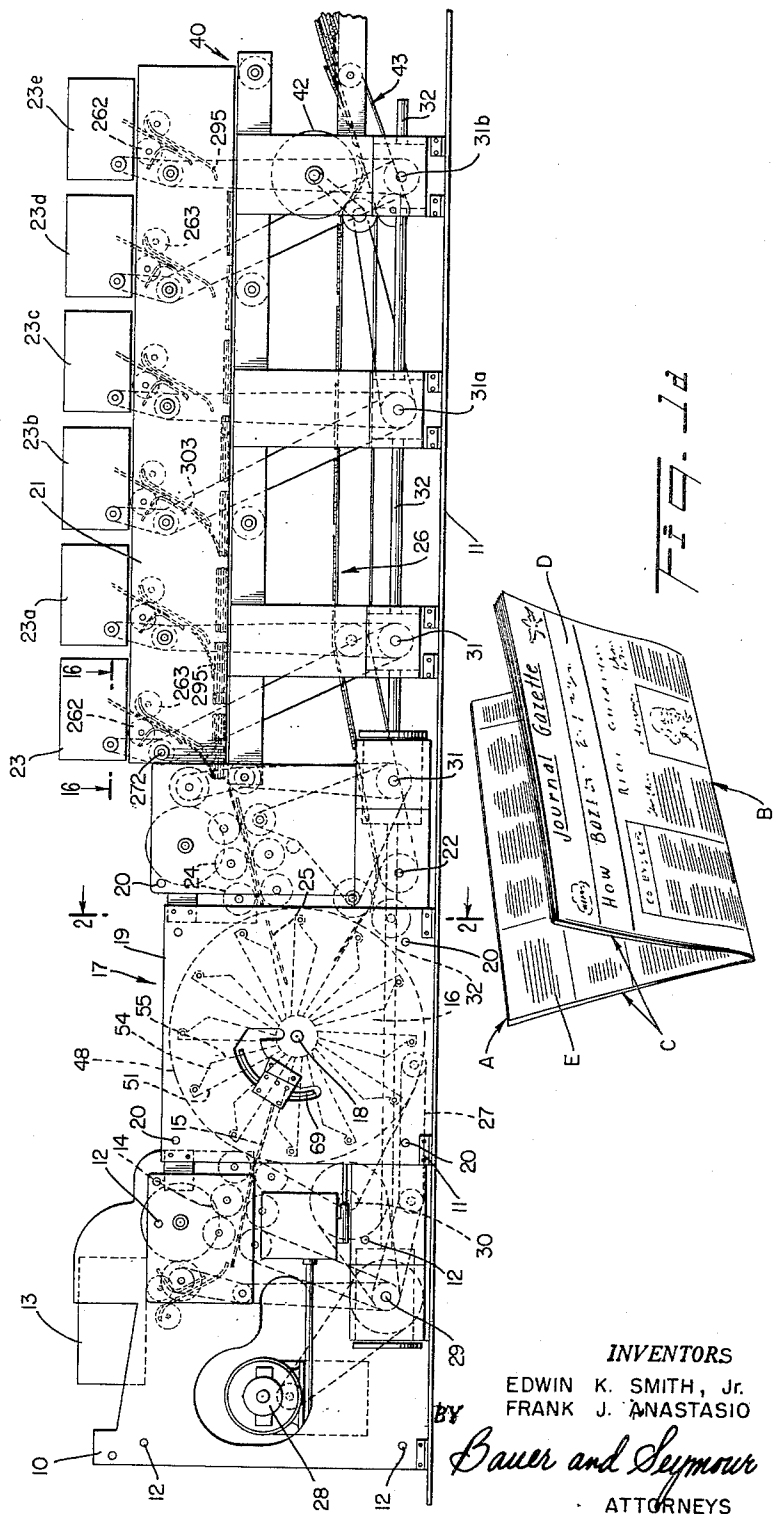


FIG. 2

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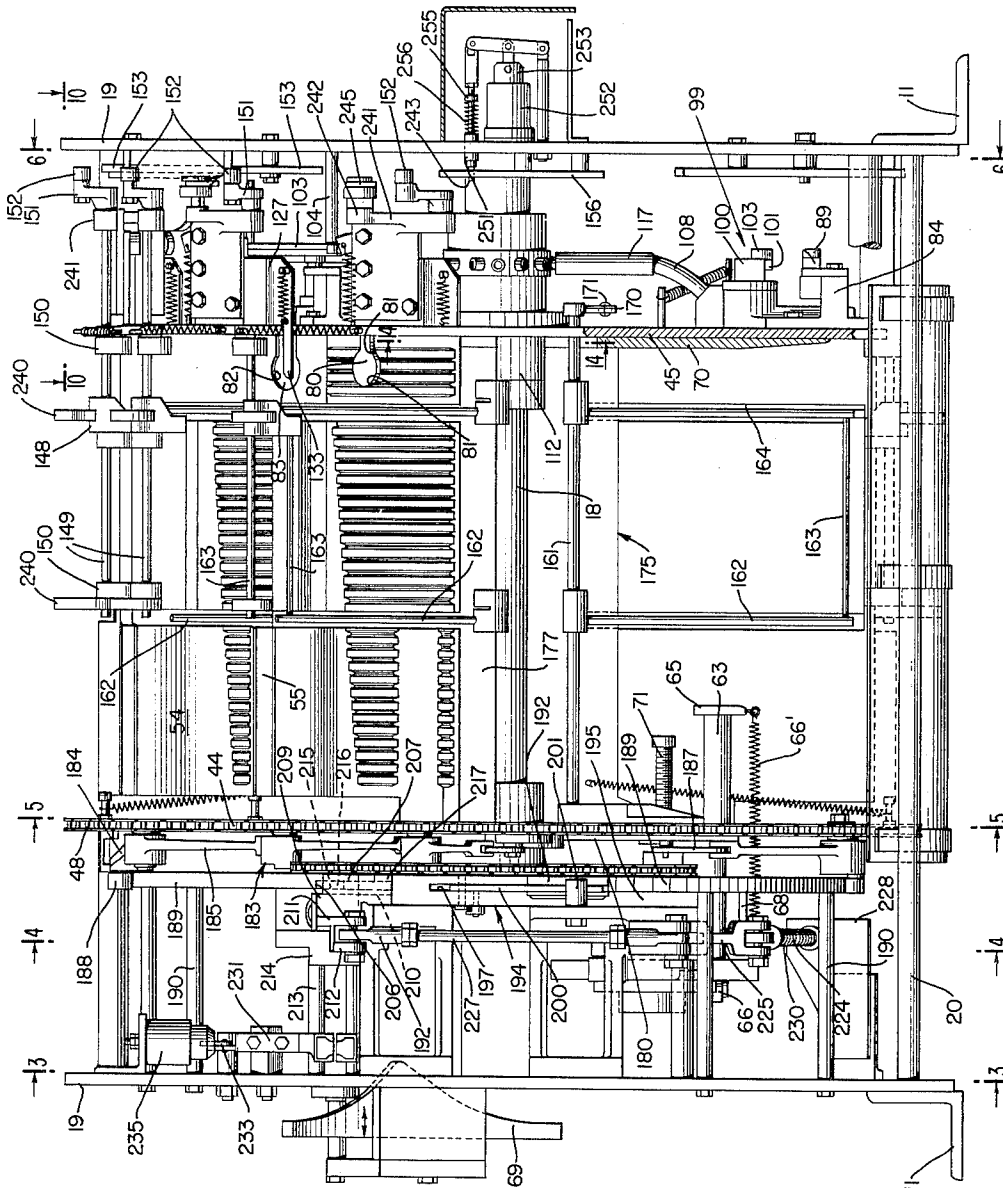


Fig. 2

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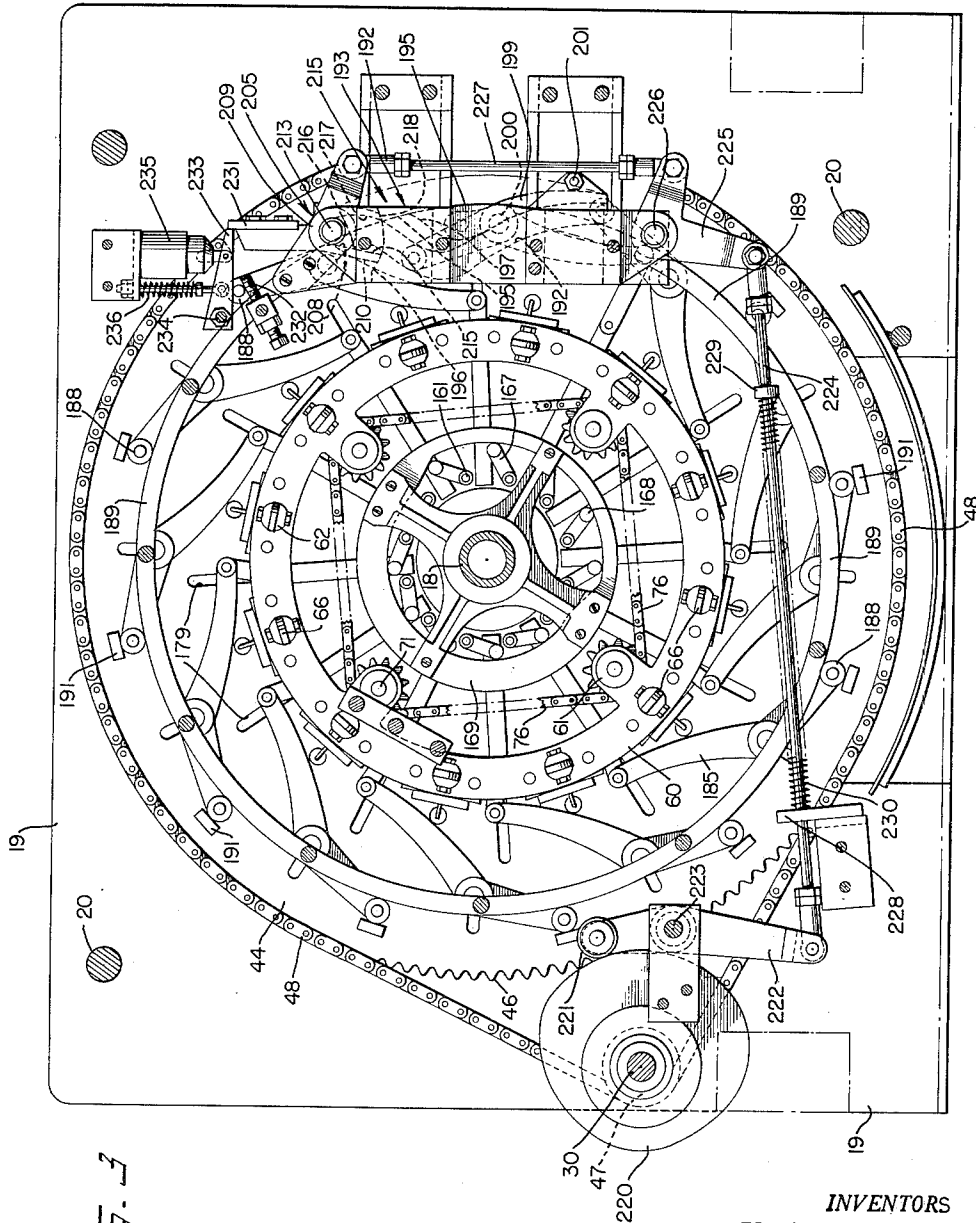


FIG. 3

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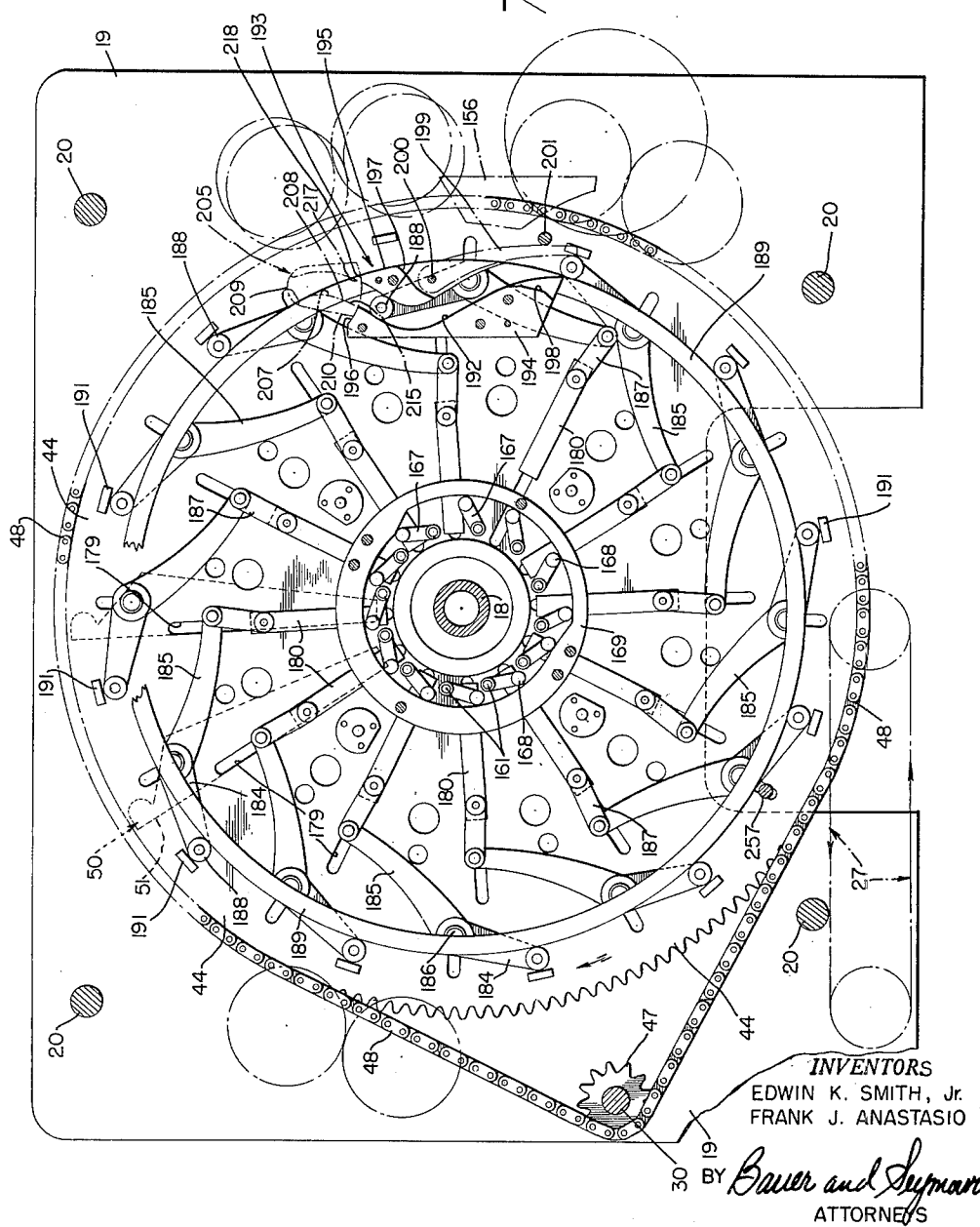
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FIG. 4



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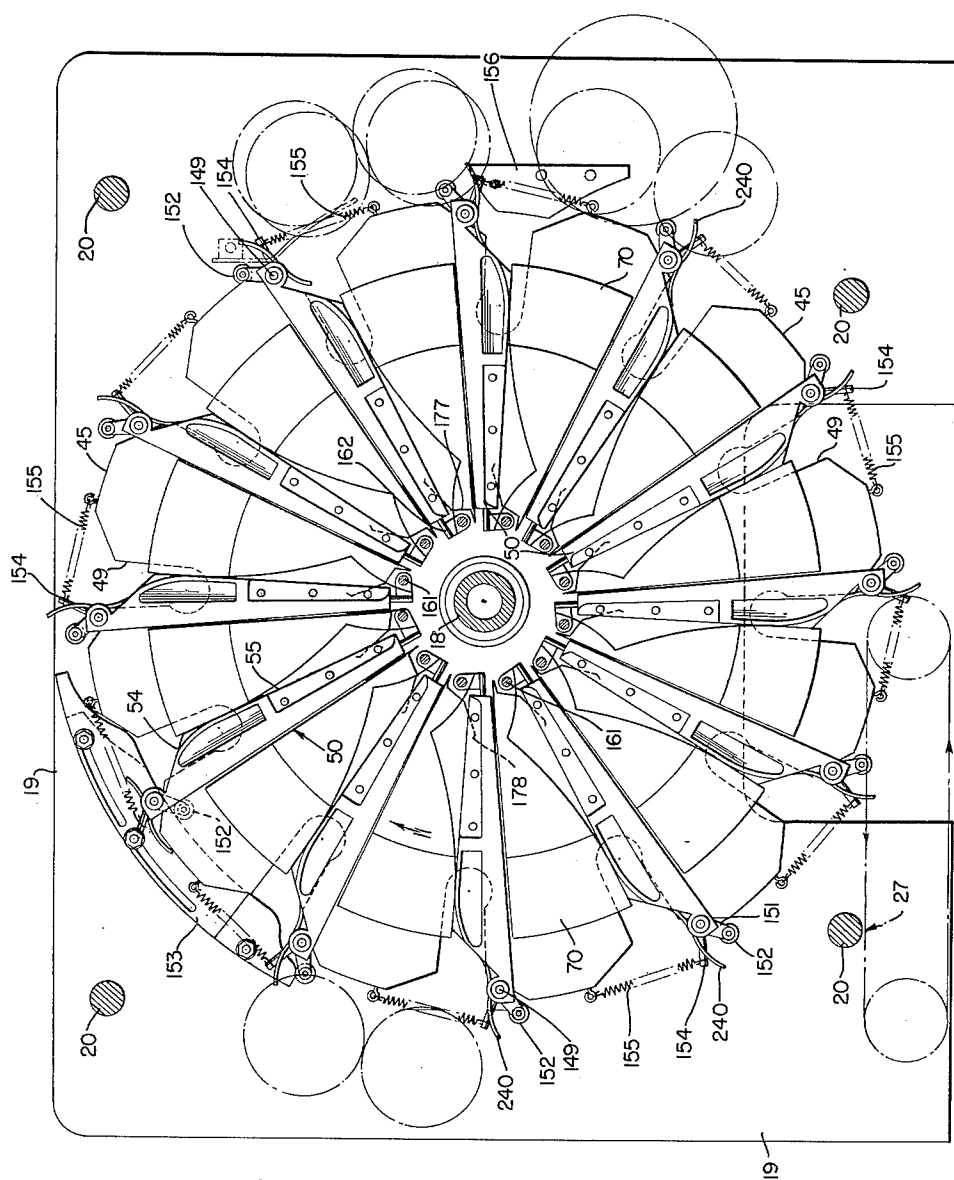


FIG. 5

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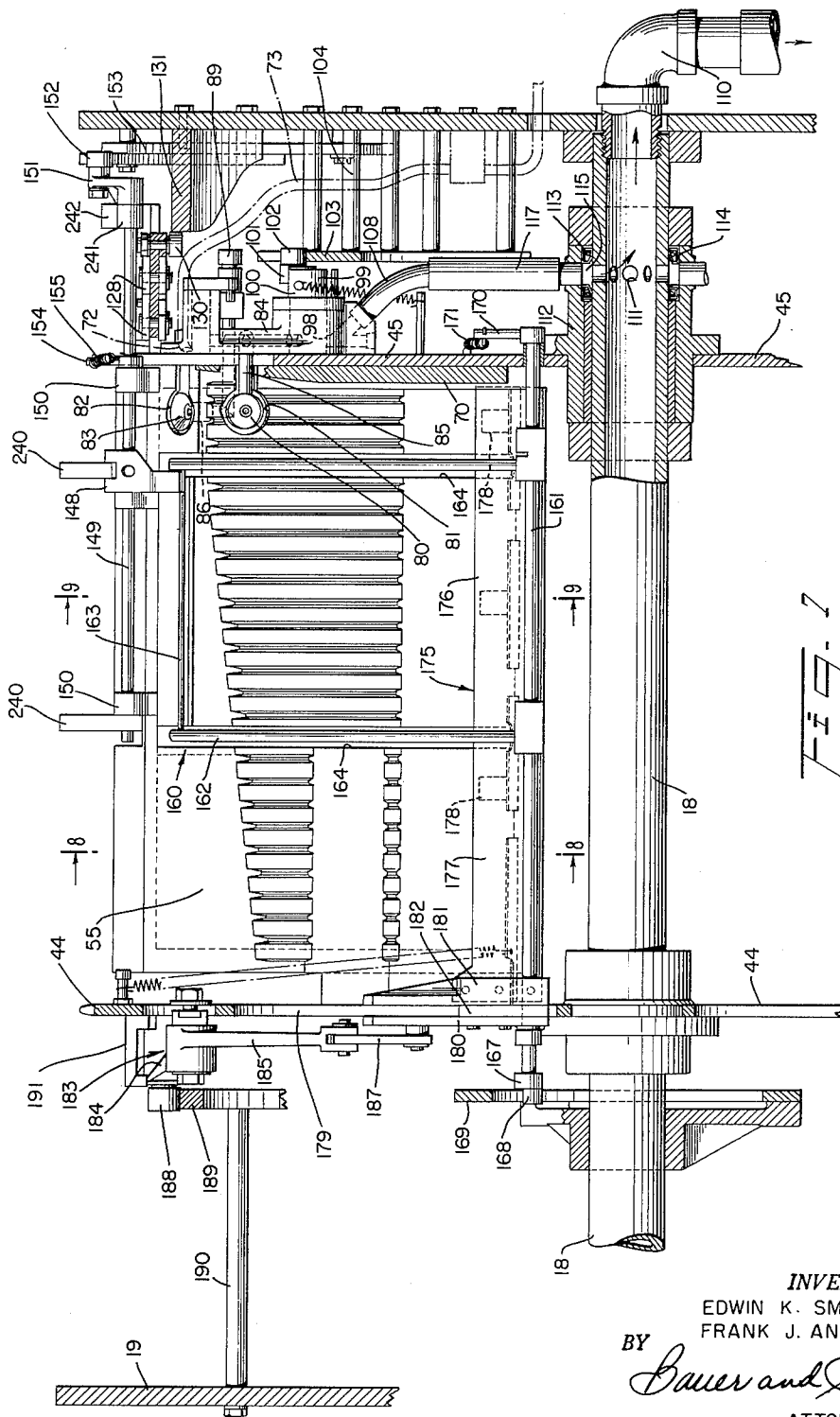
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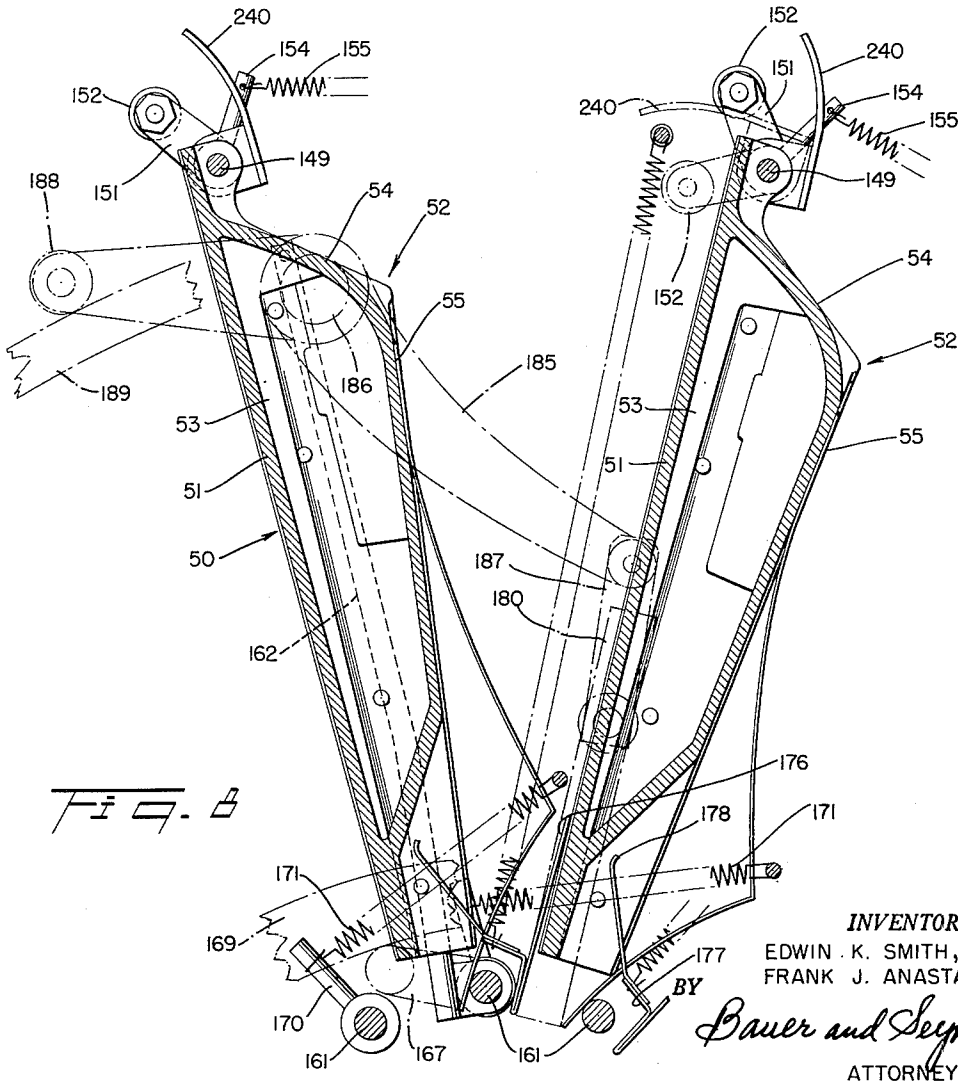
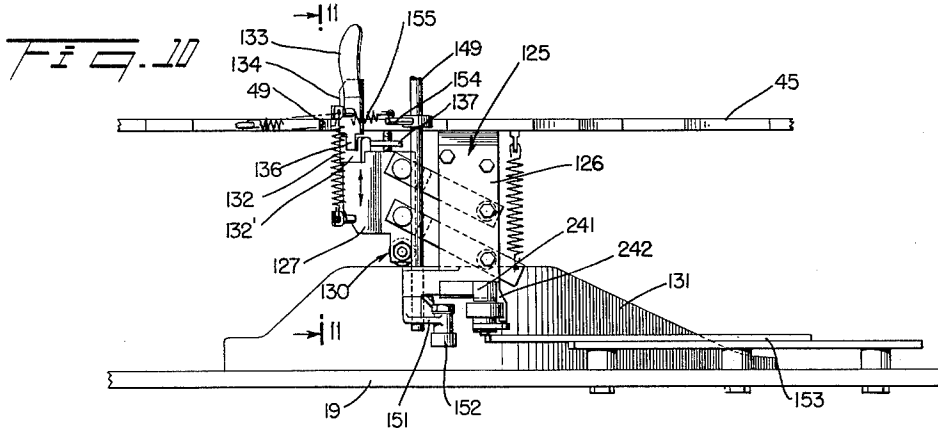
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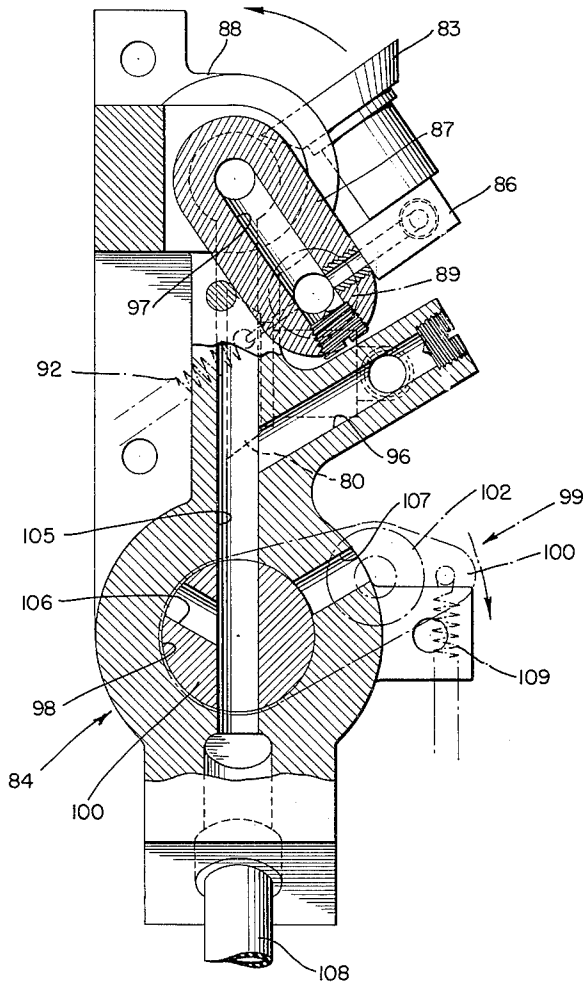
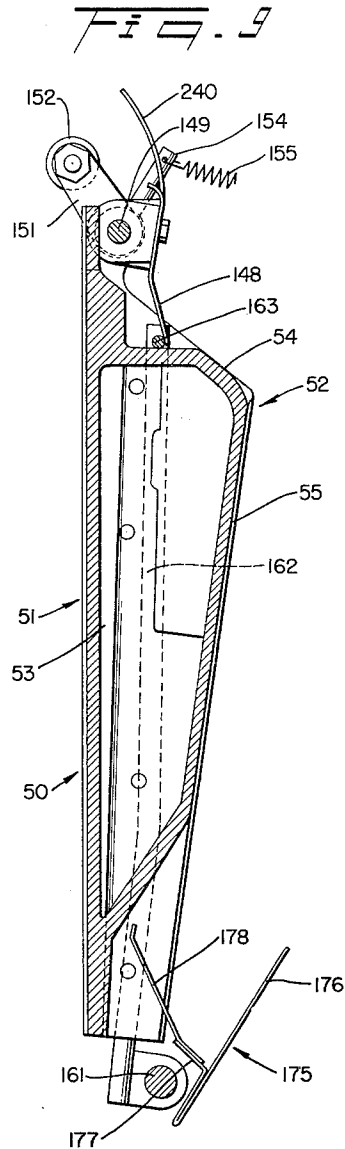


Fig. 13



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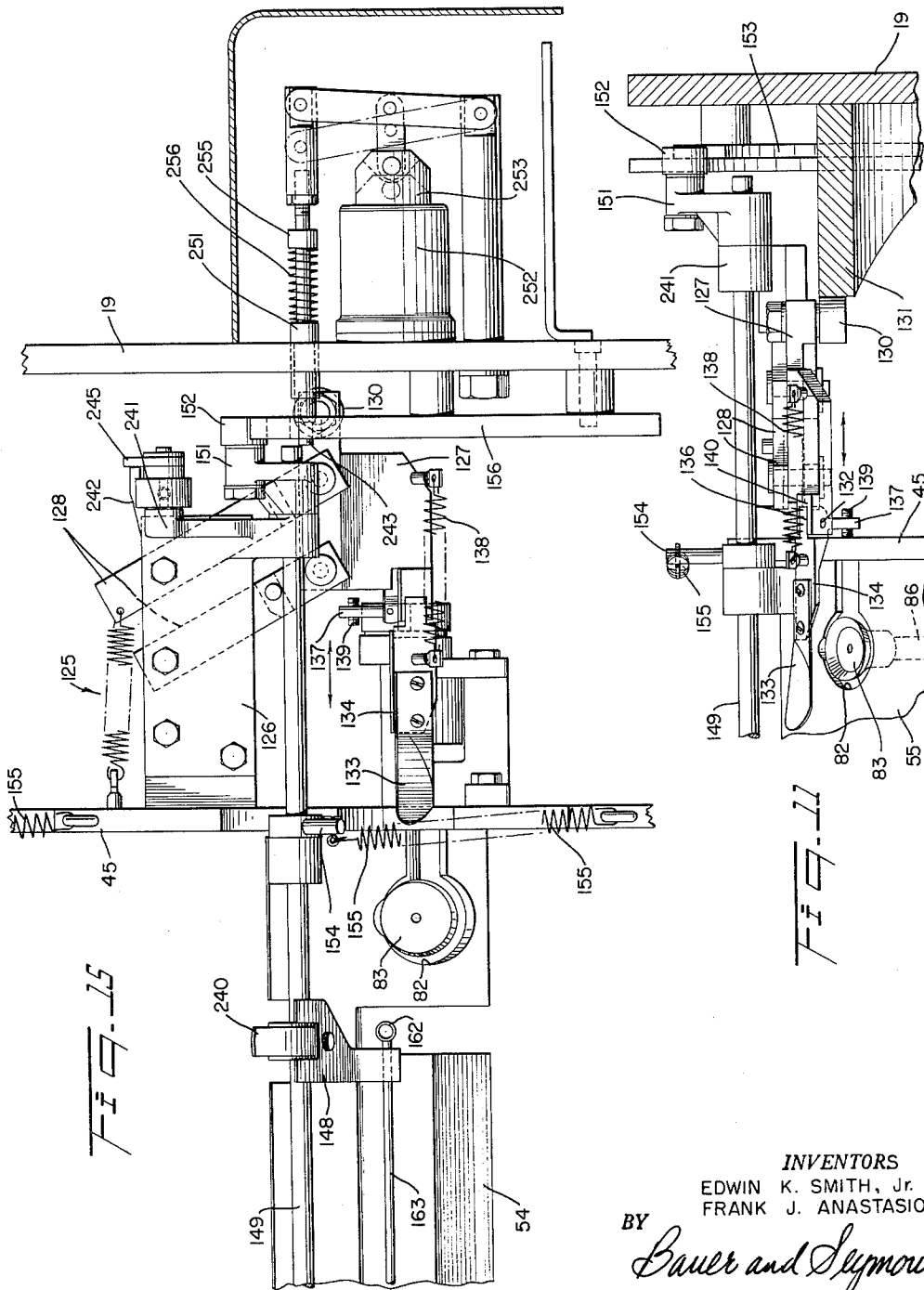
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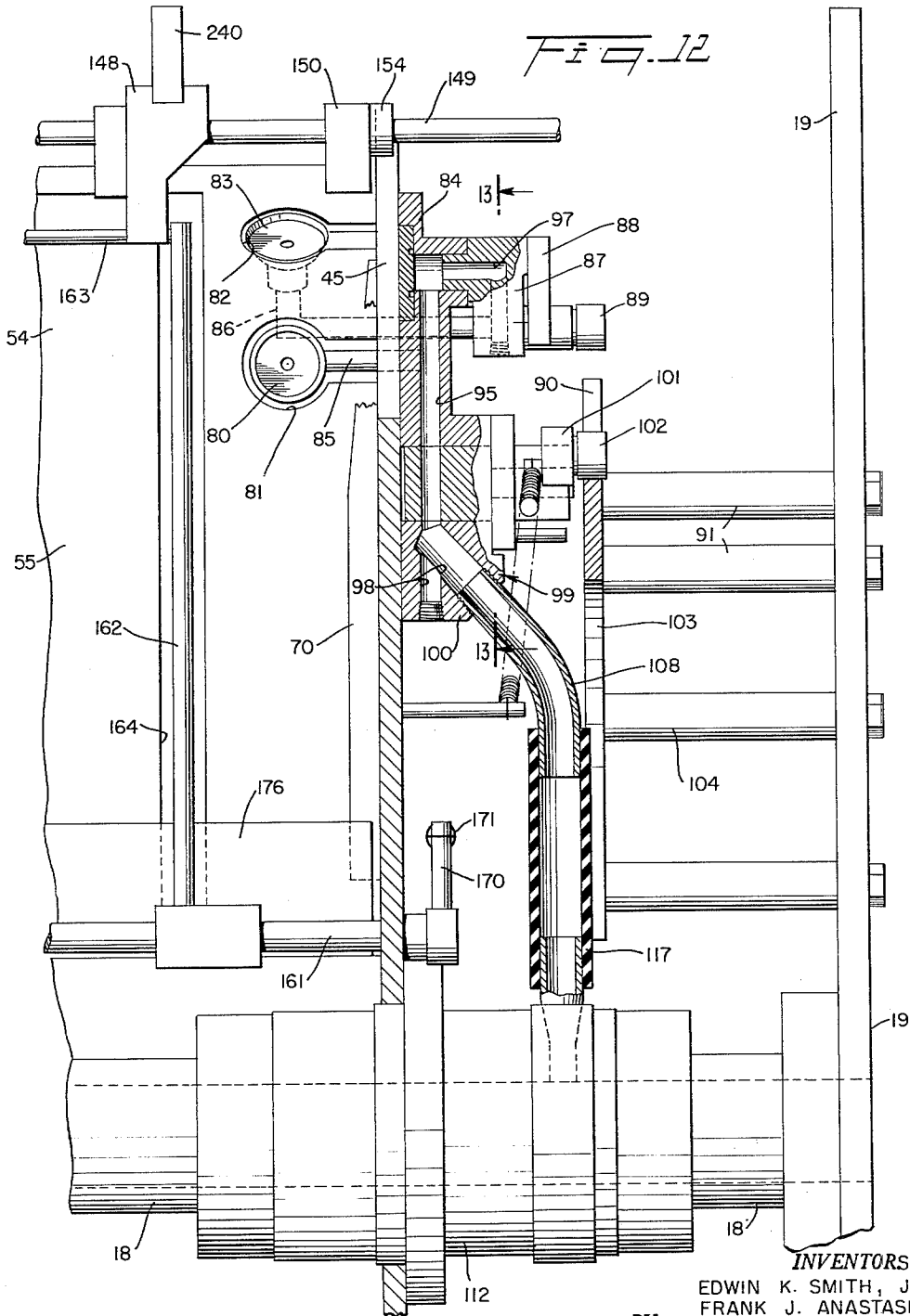
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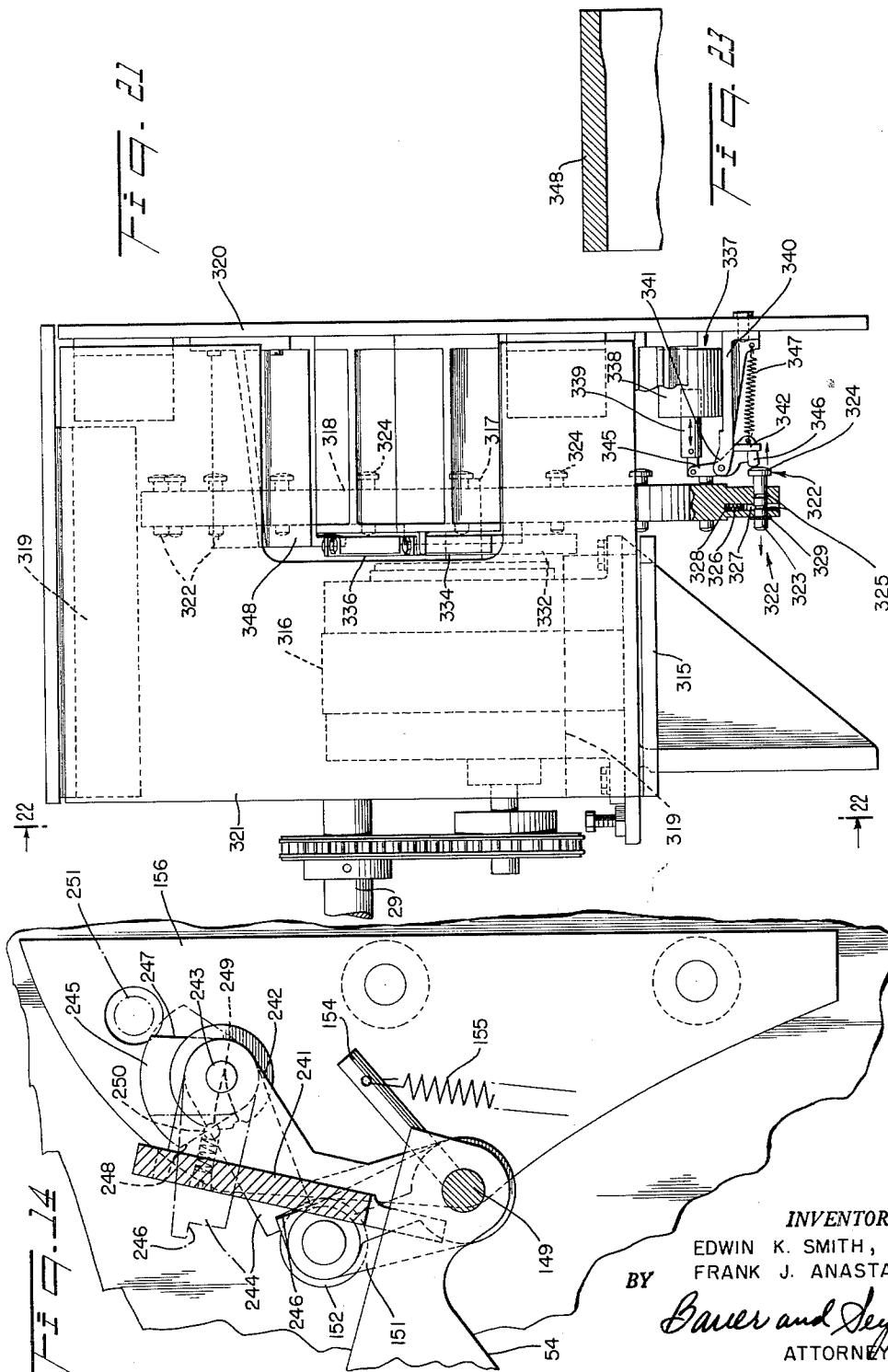
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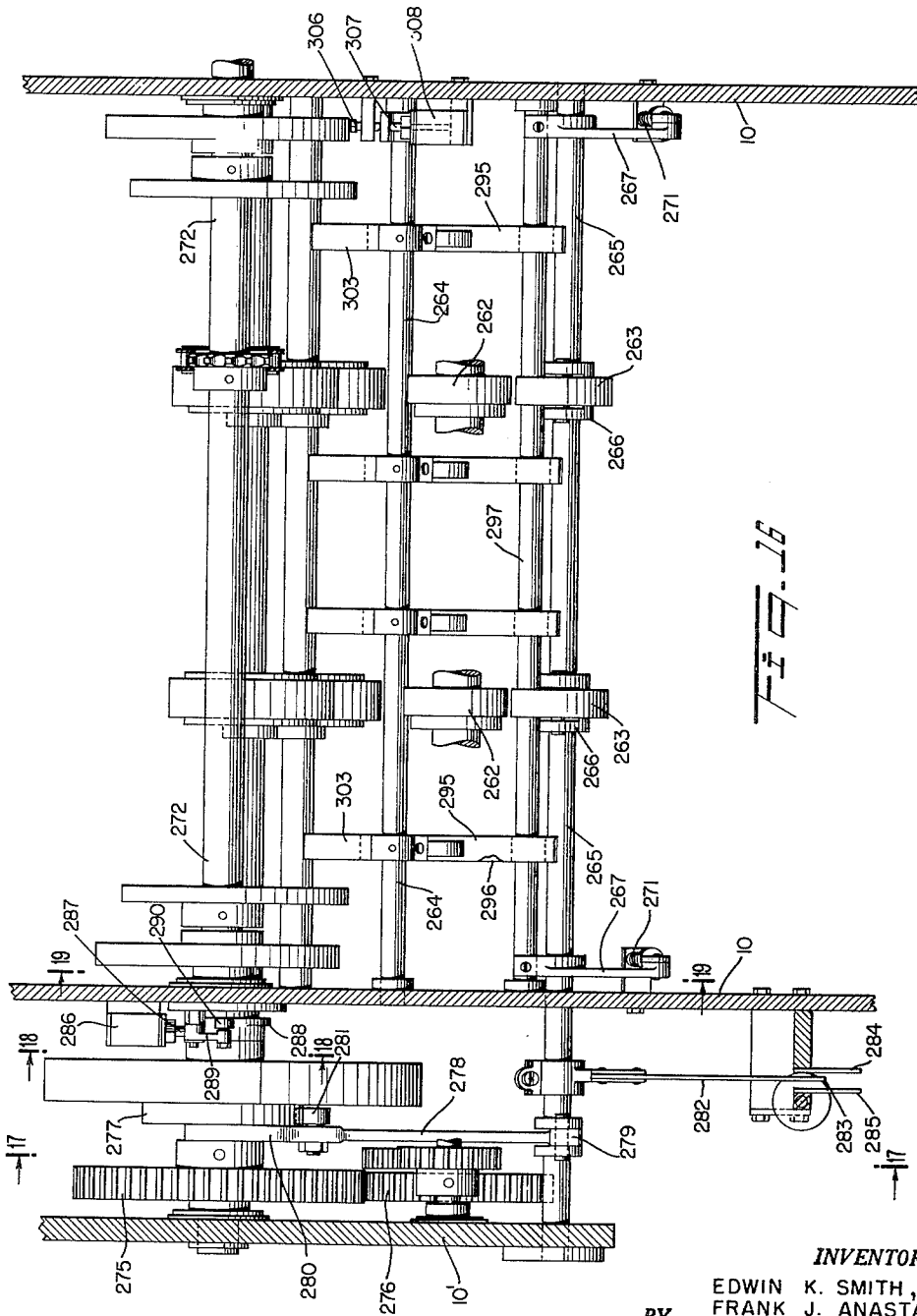


FIG. 16

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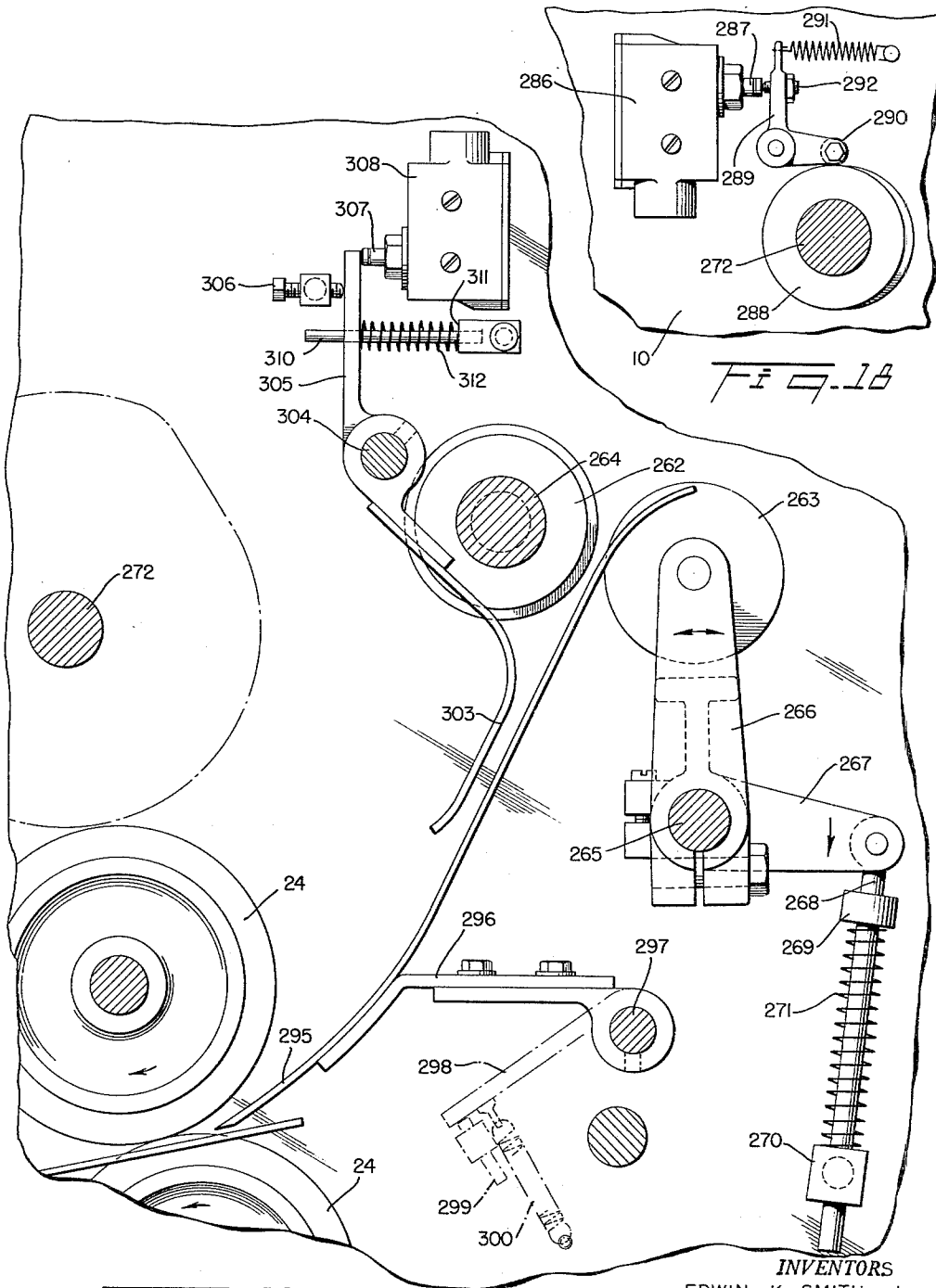


FIG. 19

FIG. 18

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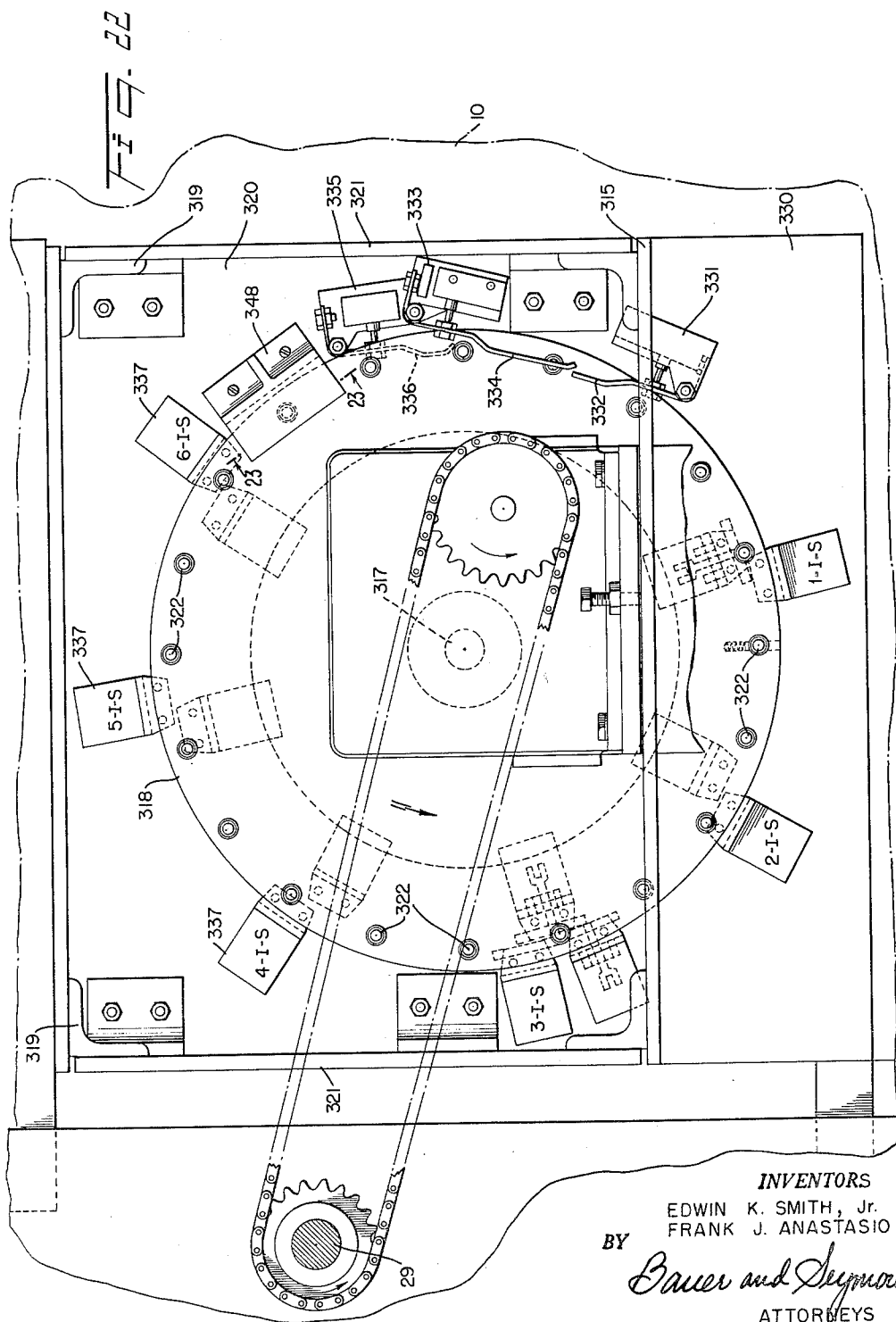
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## NEWSPAPER STUFFING MACHINE

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Filed July 17, 1959, Ser. No. 827,737  
20 Claims. (Cl. 270—57)

This invention relates to a paper stuffing apparatus and more particularly to an apparatus for inserting one or more sections of a newspaper into an opened section which serves as a cover or jacket for holding all the newspaper sections together for distribution convenience.

One object of the present invention is to provide an improved apparatus which will efficiently stuff newspaper sections into a jacket section at an increased rate of speed over other apparatuses used for the same purpose.

Another object is to provide an improved apparatus for stuffing newspapers which is compact and occupies less floor space than other apparatuses used for this purpose and at the same time is rugged in construction and efficient and smooth running in operation.

Another object is to provide an improved newspaper stuffing machine which will continuously assemble successive groups of newspaper sections and automatically deliver and stack properly assembled groups and automatically detect and divert any misassembled groups from the stacked properly assembled groups.

Another object is to provide an improved newspaper stuffer adaptable to insert either single or multiple newspaper sections into a newspaper section which serves as a cover or a jacket.

Another object is to provide an improved newspaper stuffer having novel means for rejecting incorrectly assembled groups of newspaper sections.

Another object is to provide an improved newspaper stuffer having novel means for receiving, opening and holding a newspaper section to receive one or more other newspaper sections to form a complete newspaper.

A still further object is to provide a novel means in a newspaper stuffing machine for selectively controlling the normal discharge of properly assembled newspaper sections and the rejection of misassembled newspaper sections.

A still further object is to provide an improved newspaper stuffer which will continuously assemble newspaper sections at a high rate of speed and having new and novel means for caliper each section comprising the assembled section to record and reject any defective sections without interrupting the continuous operation of the apparatus.

In the drawings wherein like reference characters refer to like parts throughout the several views,

FIG. 1 is a vertical longitudinal sectional view of the entire newspaper stuffing machine, including the jacket feed hopper and the insert feed hoppers located on either side of the stuffing wheel, said view being taken on line 1—1 of FIG. 2;

FIG. 1A is a perspective view of a typical newspaper section;

FIG. 2 is an end view of the stuffing wheel taken on line 2—2 of FIG. 1, with the lower half of the stuffing wheel broken away to show the internal portion of a pocket;

FIG. 3 is a cross sectional view of the stuffing wheel taken on line 3—3 of FIG. 2 and showing the operating cams for the beater arm and the pocket eject mechanisms;

FIG. 4 is a cross sectional view of the stuffing wheel taken along line 4—4 of FIG. 2 and showing the operating cam and the linkage mechanisms for operating the pocket eject mechanism;

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FIG. 5 is a cross sectional view of the stuffing wheel taken along line 5—5 of FIG. 2 and showing an end view of the pocket eject mechanisms together with the jacket section holding fingers;

FIG. 6 is a cross sectional view of the stuffing wheel taken along line 6—6 of FIG. 2 and showing the cams for controlling the vacuum to the suckers, controlling the movement of the movable sucker, controlling the movement of the push-down finger, and controlling the movement of the hold-down finger;

FIG. 7 is a longitudinal view of a pocket taken along lines 7—7 of FIG. 6 which lies along the leading edge of a pocket with a portion of the stuffing wheel shaft cut away to more clearly show the structure for supplying vacuum to the suckers associated with each of the pockets;

FIG. 8 is a cross sectional view of a stuffing wheel pocket taken along line 8—8 of FIG. 7;

FIG. 9 is a cross sectional view of the structure which constitutes one wall of a pocket and taken along line 9—9 of FIG. 7;

FIG. 10 is a fragmentary top plan view of the stuffing wheel showing the structure of the jacket section depressing finger which sequentially reciprocates into each pocket section as each pocket section rotates past said finger;

FIG. 11 is an end elevational view of the jacket section depressing finger structure taken along line 11—11 of FIG. 10;

FIG. 12 is a fragmentary horizontal view of one end of the wall pocket and showing the structure for supplying suction to the suckers as well as the structure for operating the movable sucker;

FIG. 13 is a cross sectional view of the mechanism which controls the vacuum to the suckers and taken along line 13—13 of FIG. 12;

FIG. 14 is a fragmentary cross sectional view of one end of a pocket and showing the mechanism for locking the reject pocket holding fingers in operating position, said view being taken on line 14—14 of FIG. 2;

FIG. 15 is a fragmentary cross sectional view taken along line 15—15 of FIG. 14 showing an end view of the reject pocket holding finger locking mechanisms and the mechanism for actuating said locking mechanisms;

FIG. 16 is a top plan view of the caliper means associated with each hopper taken along line 16—16 of FIG. 1;

FIG. 17 is a side view of the caliper means taken along line 17—17 of FIG. 16;

FIG. 18 is a side view of the caliper circuit control switch taken along line 18—18 of FIG. 16;

FIG. 19 is a side view of the caliper rolls taken along line 19—19 of FIG. 16;

FIG. 20 is an enlarged longitudinal view of the mechanism for moving each jacket section in the pocket, said mechanism being shown in the cut-away portion of FIG. 2;

FIG. 21 is a side view of the memory wheel structure with certain portions cut-away for a clearer illustration;

FIG. 22 is an end view of the memory wheel structure taken along line 22—22 of FIG. 21; and

FIG. 23 is a cross sectional view of the memory wheel pin reset plate taken along line 23—23 of FIG. 22 and more clearly showing the contour of the operating surface of said plate.

Referring now to the drawings, there is shown in FIG. 1A a newspaper section A, as used in connection with this apparatus, which comprises one or more newspaper sheets placed one on top of each other and folded longitudinally along the fold C and then folded transversely to fold C along the fold B to form two halves designated as D and E. Each newspaper section A which is to serve as a jacket or cover portion of the assembled newspaper is caused to be opened so that the halves D and E are spread apart into an opened V to receive there-

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between any desired number of similarly folded newspaper sections. Throughout this specification, the term "jacket section" refers to a newspaper section A which will receive between the halves D and E one or more newspaper sections. The term "insert section" means a newspaper section A which is placed between halves D and E of the jacket section. Since all of the newspaper sections are folded in the same manner and are approximately the same shape, any section may be used as a jacket section while the balance of the sections making up a complete newspaper become the insert sections.

Throughout this specification, the term "inner" is used in reference to the center of the stuffing wheel 17 and the term "outer" is used to indicate a direction away from the center of the stuffing wheel. Thus, in referring to various mechanisms attached to or associated with this machine, an "inner surface" or "inner end" would refer to the surface or end nearest the center of the stuffing wheel and an "outer surface" or "outer end" would refer to a surface or end furthest away from the center of the stuffing wheel.

FIG. 1 shows a diagrammatic layout of the various elements making up the newspaper stuffing machine together with the drive mechanism for said various elements. A pair of upwardly extending plates 10 are secured to a base 11 and are held in spaced apart relationship by spacer bars 12. Suitably mounted between plates 10 is a hopper for holding a supply of newspaper sections which are used as jackets and into which the other sections of the newspaper are inserted. The hopper also includes a mechanism for withdrawing therefrom one newspaper section at a time and the entire unit is generally designated 13. The particular structure of the hopper and means for extracting one newspaper section at a time therefrom forms no part of this invention and may be of any suitable construction such as that shown in U.S. Patent No. 761,496 issued to C. A. Juengst, dated May 31, 1904 or in U.S. Patent No. 2,159,987 issued to J. Hartmann et al. dated May 30, 1939. From the hopper 13, the jacket sections are fed into a feed roll caliper device, hereinafter to be described, and hence into feed rolls 14 and along guides 15 and into a pocket 16 of the stuffing wheel generally designated as 17. The stuffing wheel 17, which will be hereinafter described in detail, generally comprises a series of horizontally extending pie-shaped pockets 16 radially disposed about the wheel shaft 18. Shaft 18 is secured at each end in a pair of upwardly extending side plates 19, shown in FIG. 2, which are held in spaced apart relation to each other by spacer bars 20 and which, in turn, are suitably secured to the base 11 and to plates 10. Positioned adjacent the other side of the stuffing wheel and also suitably secured to the base 11 and to plates 19 are a pair of upwardly extending side plates 21 which are held in spaced apart relationship by spacer bars 22. Suitably secured between plates 21 are a series of six hoppers 23, 23a, 23b, 23c, 23d and 23e for holding a supply of insert sections which are to be inserted into an opened jacket section and each of which includes means for extracting one insert section at a time from each hopper. The particular structure of each hopper and means for extracting one insert section at a time from each hopper is of the same general construction as for hopper 13, as set forth above. From each of the hoppers 23, 23a, 23b, 23c, 23d and 23e, the insert sections are fed into a feed roll caliper device associated with each of said hoppers, the structure and operation of which will hereinafter be described in detail, which in turn deposits each fed and calipered insert section onto a collecting conveyor, generally designated as 40. Conveyor 40 feeds the collected insert sections into feed rolls 24 and along guides 25 and into an opened jacket section previously disposed in a pocket 16 of the stuffing wheel. Also located between the side plates 21 is a discharge conveyor system generally designated as 26 to receive the correctly

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assembled newspaper sections as they are discharged from the stuffing wheel. Thus, it will be seen that the jacket sections are continuously fed from hopper 13, through a caliper mechanism, and into a pocket 16 of the continuously revolving stuffing wheel 17. As each pocket 16 containing a jacket section is revolved from the jacket feed station to the insert feed station, each jacket section is opened and held in a spread-apart position so that the insert sections collected on conveyor 40 from the hoppers 23, 23a, 23b, 23c, 23d and 23e will be fed into the opened jacket section, thereupon the jacket section is positively closed and pushed out of the stuffing wheel onto the discharge conveyor system. Each of the particular mechanisms used to accomplish each of these steps will be hereinafter described in detail. Also embodied in this machine is a means for registering and storing any detection of either too many or too few insert or jacket sections which is registered by any of the feed roll caliper mechanism associated with either the jacket section hopper or any of the insert section hoppers, whereby said registering and storing means will at the proper time actuate still further mechanisms which are associated with each pocket so that the misassembled newspaper sections contained in that particular pocket will not be discharged upon the conveyor system 26 but will be held in that pocket until said pocket reaches a point over a reject discharge conveyor system generally designated as 27.

The drive mechanism for this machine is generally shown in FIG. 1 as having a motor 28 which drives, through a suitable sprocket and chain mechanism, a shaft 29 which extends between side plates 10 and the ends of which are supported in suitable bearings in those plates. The jacket section feed rolls 14, the feeding mechanism for hopper 13, the reject discharge conveyor system 27 and the feed roll 262 are all driven by conventional sprocket and chain mechanisms from shaft 29. A shaft 30 extends parallel to shaft 29 and has its ends mounted in suitable bearings in side plates 10 and is drivably connected to shaft 29 by suitable chain and sprocket means. The stuffing wheel 17 is drivably connected to shaft 30 by suitable chain and sprocket means. Shafts 31, 31a and 31b extend between side plates 21 and have their ends journaled in suitable bearings mounted in said side plates. A shaft 32 extends horizontally across an end of the shafts 29, 31, 31a, and 31b and has a plurality of gear portions mounted thereon which mesh with bevelled gear portions mounted on the ends of shafts 29, 31, 31a and 31b. Power is thus transmitted from shaft 29 to each of shafts 31, 31a and 31b. The insert feed rollers 24, the feed rolls and caliper mechanism for each insert hopper, the discharge conveyor system 26, and the feed mechanism for each of the hoppers 23, 23a, 23b, 23c, 23d and 23e are driven from either shaft 31, 31a or 31b by suitable chain and sprocket drive mechanisms. The discharge conveyor system 26 is continuously operated so that it receives any properly assembled newspapers and carries the same to a continuously rotating star wheel 42 which then stacks the assembled newspapers in overlapped relationship on a conveyor 43, as shown in FIG. 1. The drive mechanisms for the stuffing wheel, the jacket feed mechanism and the insert feed mechanism are so designed and their speeds so coordinated with respect to each other that as the open end of each pocket 16 on the stuffing wheel is rotated past the jacket feed station a single jacket section will be inserted therein, and when the open end of each pocket is rotated past the insert feed station the proper number of insert sections which have been collected on the conveyor 40 from each of the insert section hoppers will be inserted into said pocket. In the disclosed embodiment, there is shown one jacket section hopper and feed and caliper mechanism and six insert section hoppers and feed and caliper mechanisms. It is to be expressly understood, however, that more than six insert section hoppers or as few as one

insert section hopper may be utilized within the framework of this inventive concept. Moreover, since the total thickness of newspaper sections varies a great deal a further adjustment may be desirable when using unusually thick insert sections. Under such circumstances, the supply of these unusually thick insert sections are fed very rapidly out of the respective hoppers making manual feeding of said hoppers for continuous operation extremely difficult, if not impossible. To overcome this difficulty, the insert hopper drive mechanisms are adjusted so that said insert hopper feed and calipering mechanisms are operated at half speed while the collecting conveyor 40, the stuffing wheel 17 and the jacket section feed mechanisms are all operated at full speed. It will be understood, however, that with six insert hoppers being operated at half speed operation only a maximum of three different insert sections may be fed whereas under full speed operation a maximum of six different insert sections may be fed. By the same token, when an unusually thick newspaper section is desired to be used as a jacket section an additional hopper may be mounted adjacent the jacket section hoppers 13, as shown in the present embodiment, in the same manner as shown for the multiple insert section hoppers together with a conveyor similar to collecting conveyor 40. Instead of providing for the multiple jacket section hoppers to be operated at one-half speed an alternate method would be to have each of said hoppers operate alternately at full speed. In this manner, a minimum number of operating personnel will be able to supply the jacket section hoppers for a continuous operation of this machine.

The general layout of the stuffing wheel is best shown in FIGS. 2, 3 and 5. FIG. 2 has the lower half of the stuffing wheel broken away to better show the various internal mechanisms. The stuffing wheel comprises an end wall 44 which is rotatably mounted to shaft 18 by suitable bearings. Gear teeth 46 are cut in the peripheral surface of end wall 44. A sprocket 47 is mounted on shaft 30 and a chain 48 is mounted around this sprocket and the toothed peripheral surface of end wall 44 so that the stuffing wheel will be rotated. The end wall 45 is generally circular and of the same diameter as the wall 44 but has radially extending slotted portions 49 at its outer peripheral edge as shown in FIG. 5. These slotted portions permit access of other mechanisms to the internal portions of the stuffing wheel as will hereinafter become apparent. Radially disposed about the shaft 18 and extending between and secured to end walls 44 and 45 are 12 equally spaced pocket segments generally designated 50 and generally shown in FIG. 5. Each of the pocket segments, shown in greater detail in FIG. 8, comprises a straight wall portion 51 and a spaced apart rear wall portion 52 which forms a hollow inner area 53. The rear wall portion 52 comprises an inclined shelf area 54 and a radially inclined wall portion 55. Thus, it will be seen that each pocket area 16 is the space defined by the inclined and radially extending wall portions 54 and 55 of one pocket segment 50, the straight wall portion 51 of the adjacent pocket segment 50, and the vertically extending end walls 44 and 45.

As shown in FIG. 1, a jacket insert section is fed from hopper 13 through the feeding and calipering rolls 262, 263 and feed rollers 14 and guide 15 in timed relation to the rotational movement of the pockets 16 about the axis 18 so that as each pocket becomes aligned with the lower end of guide 15 a jacket is deposited therein. For the purposes of this machine, the newspaper sections which are used as jacket sections are so placed in and fed from the hopper 13 that the folded edge B of each section enters the pocket first and the folded edge C is adjacent the wall end 45 of the stuffing wheel. The desirability of feeding each jacket section in this manner will become apparent as the various mechanisms comprising the stuffing wheel are described. As soon as each jacket has been fed into a pocket 16, the entire jacket

section is moved toward the end wall 45. The mechanism for accomplishing this is best shown in FIGS. 2, 3 and 20. Adjustably mounted to the outside of end wall 44 of the stuffing wheel and rotatable with the wheel is an annular base 60 having four integrally formed and equally spaced radially inwardly extending hub portions 61. Slidably mounted through the annular base 60 and through the end wall 44 are twelve newspaper pushers generally designated 62 each of which protrudes into the inner area of a pocket 16 of the stuffing wheel. Each of the pushers 62 are identical in construction and operation, therefore a description of one will be sufficient for an understanding of all. As most clearly shown in FIG. 20, each of the pushers 62 comprises a slide support 63 secured at one end to the base 60 and slidably extending through an aperture in end wall 44 and into a pocket 16. Slidably mounted through support 63 is a shaft 64 having a pusher plate 65 mounted on one end and a roller 66 rotatably mounted on the other end. A cam 69 is adjustably mounted to the side plate 19 and is adjusted to protrude into the circular path of roller 66 to push each newspaper section deposited in a pocket 16 against the opposite end wall of the pocket. A spring 66 has one end affixed to the lower edge of the plate 65 and extends through an aperture in the end wall 44 and has its other end affixed to a rearwardly extending portion 68 of the slide support 63. Thus, the plate 65 is continuously urged to the left, as shown in FIG. 20, and into contact with the end surface of support 63 and also serves to hold roller 66 into contact with the operating surface of cam 69. In order to provide a smooth and square surface against which the fold C of each jacket section may be aligned, there is provided a machined plate 70 which is secured to the end wall 45 and which has a cross-sectional area corresponding to that of each pocket. The adjustable cam 69 is positioned in side plate 19 in the area of the jacket feed station so that after each jacket section has been inserted in a pocket 16, each roller 66 will ride up onto the surface of the cam and cause the shaft and plate 65 to move into the pocket and push the folded edge C of each jacket section against plate 70. Cam 69 can be adjusted so that at the maximum movement of pusher assembly 62 the distance between the inner surface of plate 65 and the inner surface of plate 70 is equal to the width of the jacket section. The base 60 is adjustably mounted to the outside surface of end wall 44 thereby providing an additional adjustment whereby a wider range of newspaper widths may be accommodated. Four shafts 71 having each of their ends suitably journaled in each of the hubs 61 of base 60 extend inwardly into pockets 16 through annular openings 72 in end wall 44. Fixedly secured to each shaft 71 and adjacent the inner surface of ring 60 are sprockets 73. The balance of the external surface of each shaft 71 is provided with threads 74. Mounted in each aperture 72 is an internally threaded bushing 75 which engages the thread 74 on each shaft 71. An endless chain 76 operatively connects the sprockets 73. Thus, as chain 76 is moved all four sprockets 73 rotate and either screw the base ring 60 closer to or further away from the end wall 44. Suitable stops are provided at the ends of shaft 71 to limit the movement of base ring 60. In this manner all of the pusher assemblies 62 are moved into or out of the pockets 16 to accommodate jacket sections of varying widths. As pointed out above, this adjustment is in addition to the adjustment of the stroke of shaft 64 and pusher plate 65 which is provided through the adjustable cam 69. Each jacket section is moved in a pocket by means of the pusher 62 so that its folded edge C is in contact with and squared against the plate 70. This alignment of each jacket section in a pocket takes place simultaneously with the rotation of the pocket from the jacket feed station toward the insert feed station.

As shown in FIG. 1, the jacket half D of each aligned and squared jacket section is caused to be pushed against

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the wall 55 of the pocket 16 and the upper edge of the jacket half D is bent over and held in contact with the slanted surface 54 of the pocket 16. The mechanism for best showing this operation is shown in FIGS. 2, 6, 10, 11, 12 and 13. It will be observed from FIG. 1 that as each pocket 16 is rotated from the jacket feed station to the insert feed station, the wall 55 of each pocket travels from a substantially horizontal plane with the surface of wall 55 extending upwardly through an arcuate path to a substantially vertical plane and then back to a substantially horizontal plane with the surface of wall 55 extending downwardly at the point where the insert sections are fed into the stuffing wheel. It will also be observed that each jacket section that is inserted into a pocket will have a tendency to rest upon wall 55 of each pocket until that wall has passed the vertical plane and starts toward the horizontal plane at the insert side of the stuffing wheel. In order for the jacket section to be held in an opened position to receive the insert section, it is necessary to retain the jacket half D against the wall portions 55 and 54. To accomplish this purpose, there is provided for each pocket segment 50 a fixed suction cup 80 extending into a cut-out portion 81 at one edge of the wall portion 55. This fixed suction cup extends into pocket 16 a sufficient distance so that when a vacuum is introduced into said cup and when a jacket half D is against said cup the suction cup collapses to a slight degree its outer surface lies in the same plane as the surface of wall 55. A cut-out portion 82 in the shelf surface 54 of each pocket segment 50 permits a movable sucker 83 to pass through the shelf portion 54 and into the pocket 16. Mounted on the outer surface of end wall 45 and adjacent each slotted area 49 is a supporting frame 84. A hollow tubular support 85 having the suction cup 80 connected to one end is securely fastened to the support 84 at the other end. A hollow tubular support 86 has the movable sucker 83 affixed to one end and its other end affixed to a connecting link 87. The other end of the connecting link 87 is pivotally mounted in a yoke portion 88 at the top of frame member 84. A cam follower 89 is rotatably mounted to one end of the link 87. A cam member 90 is fixedly secured to the side plate 19 by means of spacer bars 91. When the cam follower 89 is not in contact with cam 90, the movable sucker 83 is held in the position shown in FIG. 11 which is behind the plane surface of shelf 54 and removed from the pocket 16. When the cam follower 89 rides up onto cam 90, the movable sucker 89 is pivotally moved through opening 82 into the pocket 16. The distance that movable sucker 83 will move into pocket 16 is determined by the shape of cam 90. As shown in FIG. 6, the stuffing wheel is moving in a counterclockwise direction and is carrying with it the followers 39. It will be observed that the cam 90 has a rapidly rising surface followed by a gradually decreasing surface. Consequently, when follower 89 strikes the cam surface the movable sucker 83 will be rapidly moved into the pocket 16 and then gradually withdrawn to a position which is in the plane surface of shelf 54 when said movable sucker is collapsed by the application of a vacuum in said sucker and sealed by the contact of the surface of the jacket half D against said sucker. A spring 92 has one end attached to the unpivoted end of the connecting link 87 and the other end secured to the end wall 45 to hold the connecting link and cam follower in the position shown in FIG. 13 and to also constantly urge the cam follower into contact with the cam 90. It will thus be seen that the movable sucker 83, as it rides up onto the cam 90, will move out into the pocket 16 and contact the surface D of the jacket section and pull it back into contact with the inclined surface 54 of the pocket section 50.

The mechanism for supplying vacuum to the fixed sucker 80 and the movable sucker 83 is best shown in FIGS. 6, 7, 11 and 12. An annular passage 95 vertically

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extends from the bottom surface of the supporting frame member 84 to a point just short of the top surface of said frame. An annular passage 96 extends from passage 95 and is connected to hollow support member 85 whereby the air may be evacuated from the fixed sucker 80. An annular passage 97 in the connecting link 87 joins passage 95 with the hollow tubular support 86 whereby air may be evacuated from the movable sucker 83. Suitable packing between link 87 and the yoke 88 provides an airtight connection as the link is pivotally moved. An annular passage 98 extends through frame 84 and intersects passage 95 at right angles. A lever arm 99 has a cylindrical portion 100, one end of which is rotatably mounted in passage 98 and has an integrally formed arm 101 extending at a right angle to portion 100. A cam follower 102 rides up onto cam 103, the cylindrical portion 100 is rotated. Extending through the center of the end of cylindrical portion 100 which is mounted in passage 98 is an annular passage 105 and a passage 106 angularly extending from passage 105 to the peripheral surface of cylindrical portion 100. A passage 107 angularly extends from a surface of frame 84 to passage 98. Passages 95, 105, 106 and 107 are all positioned in the same vertical plane so that upon rotation of cylindrical portion 100 various combinations of these passages are interconnected. The lower end of passage 95 is connected to a constant vacuum source through hose 108. As shown in FIG. 13, the cam follower 102 is riding on cam 103 and in said position the passage 105 in the cylindrical portion 100 of lever arm 99 is in a vertical position thus providing a clear passage connection between the fixed and movable suckers with the constant vacuum source in hose 108. When the cam follower 102 is moved beyond cam 103 the follower moves downwardly and rotates cylindrical portion 100 and passages 105 and 106 in a clockwise direction, as viewed in FIG. 11. In such a position, passage 106 is in register with passage 95 and passage 105 is in register with passage 107 thereby venting suckers 80 and 83 to the atmosphere and at the same time sealing off the source of vacuum in hose 108. A spring 109 has one end attached to arm 101 and the other end attached to the end wall 45 whereby the lever arm 99 is constantly urged downwardly or clockwise as viewed in FIG. 11 and serves to hold the follower into contact with the vacuum valve cam. One end of passage 98 forms an airtight seal against the outer surface of end wall 45. Suitable packing is provided between the passage 98 and the cylindrical portion 100 to prevent leakage of the vacuum line. As best shown in FIG. 7, shaft 18 has an annular passage extending therethrough with each end suitably capped to make said passage airtight. A pipe 110 extends into the passage of shaft 18 and leads to a vacuum pump (not shown) to maintain a constant vacuum in said passage. A series of apertures 111 are radially disposed about one end of shaft 18. A bushing 112 having a recessed area 113 overlying the apertures 111 is secured to the hub of end wall 45 between said end wall and the bearing surface on shaft 18. Packing 114 is positioned at each end of the recessed area 113 and defines an airtight annular chamber 115. Twelve annular openings extending into chamber 115 are radially disposed in bushing 112. Fittings 113 are secured in openings 116 and are connected to hoses 108. Thus, as stuffing wheel 17 together with bushing 112 and the hoses 108 are rotated a constant source of vacuum is supplied to each vacuum mechanism 84 at one end of each pocket. In FIG. 6 is shown the position of the fixed cam 90 for effecting the movement of sucker 83 into the pocket 16 and the fixed cam 103 for actuating the mechanism for applying vacuum to the fixed and movable suckers shown in relation to the position of the jacket feed station. It will thus be seen that a jacket section is inserted into a pocket 16 with the jacket half D resting against wall 55 of that pocket. As wall 55 travels from a substantially hori-

zontal plane toward a vertical plane, the movable sucker 83 is rapidly moved into pocket 16 and into contact with the upper edge of jacket half D. While sucker 83 is still in contact with jacket half D the vacuum supply follower 102 rides up onto cam 103 to supply vacuum to the fixed and movable suckers. The vacuum is held in these suckers until each pocket wall 55 reaches a plane substantially 45 degrees from the vertical in its travel toward the insert station. Consequently, the movable sucker moves the upper edge of jacket half D into contact with the pocket surface 54 and the fixed sucker holds the body of the jacket surface D against pocket surface 54 until the vacuum is released at the point described above. It will also be observed that the fixed suckers 80 and the movable suckers 83 are located on the same side of the pocket against which the jacket section fold C has been aligned. Thus, these suckers operate against the jacket half D near the folded edge C so that all of the sheets in the jacket half D are also pulled against surfaces 54 and 55, respectively, of each pocket segment 50.

Since most jacket sections consist of several pages, additional means generally designated as 125 are provided to assure that all of the upper edges of jacket half D are compressed against pocket wall 54 and supplement the function of movable suckers 83. FIGS. 6, 10 and 11 best show this mechanism. Attached to the outside surface of stuffing wheel end wall 45 and adjacent each pocket 16 is a series of outwardly extending support plates 126. Since each means 125 associated with each pocket is identical in construction and operation, a description of one will be sufficient for an understanding of all. A movable plate 127 is held in the same but spaced apart plane as plate 126 by a pair of pivotally mounted link members 128 and has a cam follower 130 rotatably mounted to an outside edge of said plate. A spring 129 has one end attached to the end of a link member 128 and its other end attached to end wall 45 so that the movable plate 127 and its cam follower 130 is constantly urged away from the stuffing wheel end wall 45 and toward side plate 19. An arcuately shaped cam 131 which is fixedly secured to side plate 19 and in the path of the cam followers 130 as they are rotated with the stuffing wheel. The inside edge of movable plate 127 has a yoke 132 and a recessed area 140 on the top surface of the yoke. A finger 133 having its outer end bent upwardly at a 45 degree angle is fixedly secured to a finger base 134. The finger base 134 has at its rear end, a yoke receiving portion 135, a horizontally extending lip 136, and a laterally extending arm 137. A spring 138 having one end attached to a pin in the upper surface of finger base 134 and its other end attached to a pin in the upper surface of movable plate 127 with the lip 136 locked into the recess 140. The finger assembly is so positioned on end wall 45 of the stuffing wheel that the finger 133 is moved into and out of pocket 16 through the slotted area 49 in end wall 45. Arm 137 extends laterally beyond said slotted portion 49 and has a transversely positioned set screw 139 the forward end of which strikes the end wall 45 when the entire assembly which is attached to movable plate 127 is moved toward end wall 45 as cam follower 130 engages cam 131. During the movement of movable plate 127 toward end wall 45 together with the movement of finger 133 into pocket 16, the set screw 139 will contact the end wall 45 before the movable plate 127 has been advanced to its maximum distance toward wall 45. After the forward end of set screw 139 has contacted the end wall 45, the continued movement of plate 127 will cause the arm 137 to be pivotally moved away from wall 45 which at the same time causes the outer end of finger 133 to be pushed downwardly toward the inclined pocket wall 54. As soon as the cam follower rides off cam 131, the movable plate will be moved to the left as shown in FIG. 11 and the spring 138 will pull the finger 133 back

into the same plane as plate 127. It will be noticed from FIG. 6 that the cam 131 which actuates the movement of finger 133 into each pocket 16 is positioned on the stationary side plates 19 to correspond to the arcuate movement of each wall 55 of each pocket segment 50 as it approaches its upwardly vertical position from the jacket feed station and proceeds past said vertical position toward the insert feed station. It will also be noticed from FIG. 6 that the cam 131 and the cam which causes the movable sucker to enter into the pocket 16 are placed in overlapping relationship. Thus, as the movable sucker 83 is being withdrawn slowly from the pocket 16, the finger 133 has been introduced into one edge of the pocket and is pressing down on the upper edge of the jacket half D and supplementing the action of movable sucker 83.

In order to further hold the upper edge of jacket half D in pocket 16 while that pocket section is travelling toward the insert feed station, there is provided a holding finger 148. This mechanism is best shown in FIGS. 6, 7, 9, and 15. Each pocket 16 has a holding finger 148 and therefore a description of one will be sufficient for an understanding of all. Finger 148 is fixedly secured to a shaft 149 which extends along the upper edge of each pocket segment 50 and extends outwardly through the slot 49 in end wall 45. A pair of shaft supports 150 extend outwardly from the upper end of wall 51 of the pocket segment 50. Fixedly secured to the end of shaft 149 is a bell crank 151. A pin 154 is fixedly secured to the shaft 149. A spring 155 is attached at one end to the pin 154 and at its other end to the end wall 45. As shown in FIGS. 6 and 9, the spring 155 will cause the shaft 149 to rotate and hold the roller end of the cam 151 in an upward position. When the pocket wall 51 together with the hold-down finger mechanism rotates to a position adjacent to cam 153, which is fixedly secured to wall 19, the follower 152 will be pushed downwardly along the surface of the cam 153 causing the shaft 149 to rotate and move the finger 148 to a position away from the slanted wall portion 54 of the finger segment 50. This is shown in FIG. 6 and in the phantom lines of FIG. 9. When the cam follower 152 is not in contact with cam 153, the bell crank 151 is normally held in an upwardly extending position as shown in FIG. 6 by the spring 155. In such a position, the finger member 148 is held downwardly as shown in FIG. 9 and against the slanted wall portion 54 of the pocket segment 50. The position of finger 148 as shown in solid lines in FIG. 9 is the normal position when the finger mechanism is not being acted upon by a cam segment. It will be observed from FIG. 6 that the cam 90 which controls the movement of movable sucker 83, the cam 103 which controls the application of a vacuum to suckers 80 and 83, cam 131 which controls the actuation of finger 133 and the cam 153 which controls the movement of holding finger 148 are all positioned in staggered overlapping relationship to each other. Consequently, as each pocket 16 is rotated past the jacket feed station, the movable sucker 83 is first moved into contact with the upper edge of jacket half D. Next the vacuum is applied to suckers 80 and 83 and at approximately the same time the finger 148 is caused to move away from the inclined wall portion 54. As the pocket continues to rotate, the sucker 83 continues to draw the upper edge of jacket half D toward the inclined surface 54. As the sucker 83 approaches the plane of surface 54, the finger 133 is actuated by cam 131 to supplement and assist in pressing the upper edge of jacket half D against surface 54. The holding finger 148 is next released and holds the upper edge of jacket half D against surface 54. The finger 148 will remain closed upon the upper edge of the jacket half D until the cam follower 152 reaches a second finger holding cam 156 which is securely attached to the wall 19 at a point just prior to the delivery station as shown in FIG. 6. When the cam follower 153 strikes the cam

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156 it will move the finger 148 away from the slanted wall 54 and thus release the jacket half D to fall downwardly by gravity upon the inserted material. A beater arm mechanism 160, best shown in FIGS. 3, 7 and 9, assists in moving the jacket half D downwardly against the inserted material or sections after the finger 148 has released the upper edge of jacket half D and just prior to the assembled newspaper sections being ejected from the stuffing wheel into the delivery rolls. As shown in FIG. 7, a shaft 161 extends horizontally through the bottom portion of each pocket 16 and beyond each end wall 44 and 45 of the stuffing wheel. Suitable bearings are provided at the point where the shaft 161 passes through each end wall 44 and 45 so that the shaft is rotatably supported therein. A pair of spaced apart beater rods 162 are secured at one end to the shaft 162 and connected at the opposite end by a rod 163. A pair of radially extending spaced apart and parallel slots 164 each having a width in excess of the diameter of beater rods 162, are formed in the surface 55 of each pocket segment 50. Inclined surface 54 of each pocket segment 50 has a cut-away portion extending between the slots 164 comprising a substantially horizontal surface and a vertical surface as shown in FIG. 9. A bell-crank 167 is securely attached to one end of the shaft 161. A cam follower 168 is rotatably mounted in the bell crank 167 and is operatively associated with a fixed cam 169. A pin 170 is securely attached to the other end of shaft 161. A spring 171 has one end secured to the pin 170 and at the other end is secured to the wall 45 and causes the shaft 161 to rotate in such a manner that the cam follower 168 is constantly urged into contact with the cam 169. When the cam followers 168 are riding on the fixed thickest portion of cam 169, as shown in FIG. 3, the beater rods 162 are positioned within the hollow portion 53 of the pocket section 50, as shown in FIG. 9, and behind the plane surface of wall 55. When the cam followers 168 move into contact with the thinnest portion of the beater arm cam 169, as shown in FIG. 3, the shaft 161 is rotated in such a manner that the beater rods 162 are moved outwardly through the slots 164 into the pocket 16 and beyond the plane surface of wall 55. Cam 169 is so positioned on shaft 18 that the beater arms 162 are actuated shortly after the finger 148 releases its hold on the upper edge of jacket half D. Thus, as the finger 148 releases its grip upon the upper edge of jacket half D, the beater arms 162 are moved out into pocket 16 and push the jacket portion D against the already inserted sections. It is to be observed that the distance that the beater rods 162 move into the pocket 16 is sufficient to aid in the closing of the jacket half D upon the inserted material, but at the same time, does not impede the normal ejection of the assembled newspaper sections from the stuffing wheel into the delivery rolls.

The mechanism which forms the bottom portion of each pocket 16 is outwardly axially movable to serve as an ejector means and is best shown in FIGS. 3, 4, 7, 8 and 9. The bottom portion of each pocket 16 is generally designated as 175 and comprises a longitudinal rear wall portion 176 and an integrally formed shelf portion 177 which extends outwardly from wall 176 at approximately 90°. A plurality of upwardly angularly bent fingers 178 are attached to the top surface of shelf 177 and are spaced along said shelf as shown in FIG. 7. A plurality of radially extending slots 179 are formed in the end wall 44 of the stuffing wheel and have one edge in alignment with the plane surface 51 of the pocket segment 50. A pair of slide guides 180 and 181 having a width greater than the width of a slot 179 and a spacer member 182 having a width less than the width of a slot 179 and a thickness substantially the same as the thickness of end wall 44 are secured together and are radially slidable in slot 179. One end of the rear wall portion 176 is fixedly secured to the slide guide 181 so that as slide guide 181 is moved radially outwardly it carries

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with it the pocket bottom 175. Associated with each pocket bottom 175 is a mechanism for controlling the outward radial movement thereof comprising a bell crank 183 having arms 184 and 185 and which is pivotally secured to the end wall 44 at 186. The bell crank 183 is mounted at 186 through a slotted area to permit adjustment of said pivot point. A connecting link 187 is pivotally connected at one end to the end of arm 185 and at the other end to the upper end of slide guide 180. A cam follower 188 is rotatably mounted to the end of arm 184. A cam 189 is fixedly secured to the side plates 19 by means of support members 190. Hold-down arms 191 are each fixedly secured at one end to the outer surface of wall 44 and have their other end in contact with the upper surface of arm 184 at a point adjacent each cam follower 188. The upward movement of arm 184 is thus limited by the arm 191 and the cam follower 188 is at the same time held in contact with the outer surface of cam 189. As long as the cam follower remains on the outer surface of cam 189, the bottom portion 175 of each pocket section will remain at its lowermost position in each pocket. However, when a cam follower 188 is directed into the cam segment 192 of an eject mechanism which is generally designated 193, the arm 185 will be swung upwardly and carry with it the slide guides 180 and 181 together with the pocket bottom 175. It will be observed from FIG. 4 that the cam reject mechanism is so positioned on the side plate 19 that the radial outward movement of the pocket bottom 175 occurs as each pocket is revolved into alignment with the delivery rolls. By this mechanism each of the properly assembled newspaper sections is ejected or kicked out of the pockets 16 into the delivery rolls. The reject cam track 192 is cut into one surface of an ejector cam segment 194 which is a part of the eject mechanism 193. A segment of cam 189 is cut way, as shown in FIGS. 3 and 4, and the ejector cam segment 194 which has a thickness greater than the thickness of width of cam 189 is mounted by suitable brackets into said cut-out portion by suitable support members so that the inner surface of segment 194 into which is cut the cam track 192 is in vertical alignment with the inner surface of cam 189. The outer edge of ejector cam segment 194 has an arcuate surface 195 corresponding to the arcuate surface of the cut-out portion of cam 189 so that in effect the surface 195 represents a continuation of the cam surface 189. One end of cam segment 194 has a cut-away portion for forming a splice with the cam 189. The other end of cam segment 194 is spaced apart from the end of cam 189 and has an arcuate surface 196 which cuts across the cam track 192 and forms an operating surface for a switching track to be described later. A longitudinal slot 197 is formed in the surface 195 of the ejector cam segment 194 and extends downwardly into the cam track 192 and through the cam track 192 at 198. A lever 199 having a width slightly less than the width of slot 197 has one end pivotally mounted therein at 200. The movable end of lever 199 has a thickness such that when said lever end is mounted in slot 198 of cam track 192 the upper surface of lever 199 is in register with and has the same curvature as surface 195. Thus, as a cam follower 188 is diverted, by switching means to be described hereinafter, along the surface 195 of the ejector cam segment said follower when it strikes the lever 199 will push the same down into the slot 197 to form a continuous surface and the cam follower will continue along cam 189 without interruption and without moving the pocket bottom 175. The inner surface of the lever 199 has a curvature corresponding to the curvature of the cam track 192. Thus, when the cam follower 188 is directed through the switching means to the cam track 192 and as the cam follower is moved through the cam track 192, it will strike the inner surface of cam 199 and push the same outwardly until the outer surface of the lever strikes a stop pin 201. It will be noticed from

FIG. 4 that the stop pin 201 is so positioned that when the lever 199 is in contact with said pin the inner surface of lever 199 represents a continuation of the same width of the cam track 192.

Turning now to the switching mechanisms generally designated as 205 in FIGS. 3 and 4, it will be seen that the severed end of cam 189 has a cut-out portion 206 and a tongue portion 207. The tongue 207 has a downwardly curved portion 208. A cylindrical body 209 has an integrally formed and downwardly depending arm portion 210 at one end thereof and an integrally formed arm 211 having a yoke 212 positioned at right angles to arm 210. A shaft 213 having one end rotatably mounted in side plate 19 extends through a shaft support 214 and extends into the cylindrical body 209. The cylindrical body 209 is fixedly secured to shaft 213 so that any rotational movement imparted to the body 209 will also impart rotational movement to the shaft 213. Cut into the end surface of arm 210 is a switching cam track 215 comprising a straight wall portion 216 and a curved wall portion 217. The outer wall portion 218 of the arm 210 has a curvature complementary to the curvature 196 of the end of cam segment 194. The straight wall portion 216 of the switching cam track 215 has a cutout portion corresponding to the width of the cut-out portion 206 of the cam 189. Thus, it will be seen, in the assembled relationship of the parts the arm 210 with the recessed cam track 215 facing toward the stuffing wheel is placed so that the straight wall portion 216 of the switching cam track is fitting into the cut-out portion 206 of the cam 189 while the wider curved wall 217 extends over the tongue 207 of the cam 189 in a spaced apart relationship. In the position of the switching cam track 215 as shown in FIG. 4, it will be seen that a cam follower 188 which is being rotated in a clockwise direction with the movement of the stuffing wheel will ride upon the top surface of cam 189 until it reaches the switching cam track 210. The cam follower 188 will then be directed downwardly between the curved wall 217 of the switching cam track and the downwardly curved portion 208 of the cam tongue portion 207 and into the eject cam track 192. When the arm portion 210 and the switching cam 215 is moved counterclockwise as viewed in FIG. 4, the straight wall portion 216 of the switching cam track is then in alignment with the arcuate surface 195 on the eject cam track 192 and the top surface of the cam 189. In this position, a cam follower 188 upon reaching the switching cam track 215 will be maintained in the same arcuate path as provided by the surface of cam 189 as it passes between the surfaces 216 and 217 of the switching cam track 215. It will be observed from FIG. 4 that the cam surface 207 upon which the cam follower 188 rides when it is being directed into the eject cam track 192, and the straight wall 216 of the switching cam track which supports the cam follower 188 as it is being maintained in the same arcuate path of the cam 189 are approximately one-half the width of the cam follower 188. This is necessitated because of the close interlocking relationship of the parts but is sufficient to support the roller and to guide it in the desired direction. As shown in FIGS. 3. and 4, ejection cam mechanism 193 is positioned on the plates 19 so that the cam follower 188 associated with a pocket 16 has reached the point of its greatest radial inward movement and the pocket bottom 175 has reached its greatest radial outward movement as the pocket associated with that follower comes into alignment with the delivery rolls. A cam 220 is fixedly secured to the shaft 30 and is operatively associated with cam follower 221 which is rotatably mounted in one end of crank 222. The other end of crank 222 is operatively connected to the switching cam track 215 through a series of connecting rods and bell cranks so that upon rotation of the cam 220 the switching cam track 215 is alternately moved to register with the eject cam track 192 and then to register with the cam surface 195. This mechanism is

best shown in FIG. 3. The crank 222 is pivoted about a point 223 which is secured to the side plate 19. Pivotally secured to the lower end of crank 222 is a generally horizontal connecting rod 224 which is pivotally connected at its other end to a bell crank 225 which is pivoted about a fixed point 226. A generally vertically extending connecting rod 227 is pivotally connected at its lower end to the other arm of bell crank 225 and is pivotally connected at its upper end to the yoke 212 on the switching cam arm 210. The connecting rod 224 slidably passes through a stationary plate 228 which is secured to the connecting rod 224 and a spring 230 is telescopically mounted over the connecting rod 224 and compressed between the plate 228 and the collar 229. Spring 230 thus urges the connecting rod 224 to the right as shown in FIG. 3 and will constantly urge the cam follower 221 into contact with the cam 220. A stop plate 231 is fixedly secured to one end of shaft 213 in an upwardly vertical position when the cam follower 221 is on the high part of the cam 220. The switching cam track 215 is pivotally moved into operational contact with the cam surface 195 and the plate 231 will pivotally move to the left and rest against an adjustable stop pin 232. A stop lever 233 is pivotally positioned in the path of movement of plate 231 and is mounted at one end thereof around point 234 and is secured at the other end to the movable cylinder of the solenoid 235. When the solenoid 235 is not activated a spring member 236 holds the solenoid cylinder at its fully extended position and at the same time holds the forward end of the stop lever 233 in the path of movement of the plate 231. In such an interlocked position, the shaft 213 is prevented from rotating which in turn holds the switching cam track 215 in operational contact with the eject cam track 192 and also holds the connecting rods 227 and 224 stationary and prevents the cam follower 221 from riding down onto the low part of the cam 220. As long as the stop lever 233 remains positioned in the path of movement of the lever 231, the switching cam track will direct the cam followers 188 of each pocket 16 into the eject cam track 192 and the contents of that pocket will be ejected into the delivery rolls. If, however, for some reason a pocket contains less than the required number of sections or more than the required number of sections necessary to constitute a proper assembly, then the outward radial movement of the bottom portion 175 of that pocket is prevented by energizing the solenoid 235 which in turn will pull its cylinder upwardly against the force of spring 236 and carry with it the end of lever 233 and out of the path of movement of plate 231. It is thus apparent that as the cam follower 188 for the pocket 16 containing the misassembled newspaper sections approaches the switching cam track 215 the follower 221 is on the low part of the cam 220 and the switching cam track 215 is connected to the non-eject cam surface 195. However, since the stop lever 233 is held in the path of movement of plate 231 during the normal operation of this apparatus, the switching cam track 215 is retained in register with eject cam track 192 so that each of the cam followers 188 is directed into said reject cam track. It is, however, necessary to observe that the cam 220 makes one complete revolution while each cam follower 188 is travelling a distance corresponding to the arcuate distance between rollers 88 spaced about the outer surface of cam 189. Thus, it will be seen in FIG. 3 that as the cam follower 188 reaches a point along cam 189 which corresponds roughly to a position adjacent the pin 232, the cam follower 221 is on the high part of the cam 220 and therefore the switching cam track 215 is connected with the eject cam track 192. Now if the contents of pocket 16 which is associated with that particular cam follower 188 has a properly assembled group of newspaper sections in it, then the lock lever 233 will be retained in a downward position which will prevent the switching cam track 215 from moving and a normal ejection of the contents of

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that cam pocket will follow. If, however, the contents of that pocket which is associated with cam follower 188 has a misassembled group of newspaper sections in it then the detector mechanism and memory wheel which is to be hereinafter described will energize the solenoid 235 and cause the stop lever 233 to be withdrawn out of the path of plate 231, thus allowing the cam follower 221 to ride down onto the lower part of the cam 220 which will cause the switch cam track 215 to be rotated counterclockwise and direct the cam follower 188 along the cam surface 195 which is in effect a continuation of the outer surface of cam 189 and no rejection of the contents of that pocket will occur at the delivery rolls. It will also be noted from FIG. 3 that the cam 220 would have been rotated to its lowermost position by the time that the cam follower 188 reached a point adjacent to the switching cam track 215, so that cam follower 188 would be diverted along the cam surface 195 and prevented from entering into the cam eject track 192.

It will be observed that when a misassembled section is prevented from being normally ejected into the delivery rolls some provision must be made to hold such misassembled newspaper sections in the pocket as that pocket is rotated through the lower portion of its orbital movement. To accomplish this purpose, there are provided arcuately shaped fingers 240, best shown in FIGS. 7 and 9. In the embodiment shown each pocket has two retaining fingers 240, one being secured to the holding finger shaft 149 and one mounted to the support member for the holding finger 148. FIG. 9 shows the position of fingers 240 while the finger 148 is holding down the upper edge of jacket half D prior to the feeding of the insert sections into the opened jacket section. The dotted lines show the position of the holding finger 240 as it extends into a pocket section 16 to prevent the assembled newspaper section from falling out of the pocket. As pointed out earlier, the finger 148 is normally held down against the slanted surface 54 of the pocket segment 50 except when its cam follower 152 is riding upon the surface of either cam 153 or cam 156. Since the fingers 240 are attached to the same shaft 149 as the holding fingers 148, their rotational movement into and out of operational position will be controlled, like the fingers 148, by the rotational movement of shaft 149 which in turn is actuated through the crank 159 and cam follower 152 as said cam follower rides up onto the operational surface of either cam 153 or cam 156. Since the normal position of the finger 240 is in a non-operational position as shown in solid lines in FIG. 9, means must be provided to move the fingers 240 into operational position as the pocket 16 which contains the misassembled newspaper sections approaches the delivery rolls and to hold said fingers in said operational position until that pocket containing the misassembled newspaper sections is rotated through the lowermost arc of the path of movement to a point where it is desired to allow the misassembled newspaper sections to fall by gravity out of said pocket onto a reject conveyor system 27. Means for locking the finger 240 in its operational position together with the means for actuating and deactuating said locking mechanism is best shown in FIGS. 6, 7, 10 and 15. Secured to the top surface of the support plate 126 is a vertically extending locking mechanism support 241. The shaft 149 passes through one end of support 241 which serves as an additional support for said shaft. The other end of support 241 has a hub portion 242 to which the locking mechanism is pivotally mounted. A stationary pin 243 is mounted in hub 242 and pivotally supports a downwardly depending locking lever 244 and an integrally formed and offset pie-shaped actuating member 245. The lower end of lever 244 has a cut-out portion 246 and the actuating member 245 has actuating surfaces 247 and 248. The outer end surface of crank 151, adjacent the cam follower 152, has a square surface which is complementary to the cut-out portion 256 in the

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locking lever 244. FIG. 15 shows the relative position of the crank 151 and the follower 152 when said follower is on the high part of the cam 156 and in which position the fingers 240 are held in an operating position. The locking lever 244 is shown in solid lines with the cut-out portion 246 engaging the squared off end of crank 151. As long as the locking lever 244 remains in the position shown in solid lines in this figure, the cam follower and its crank 151 are prevented from following the contour of cam 156 and the fingers 240 are held in operational position. The dotted lines show the lever 244 when it is in its inactivated position and extending approximately parallel to the straight wall 51 of the pocket segment 50. A pair of detents 249 in the surface of pin 243 and a spring urged ball member 250 in the lever 244 serve to retain the lever 244 in either its activated or inactivated positions. A solenoid 252 having a movable cylinder 253 is securely attached to the outer surface of side wall 19 and in horizontal alignment with the cam 156. A pin 251 having one end pivotally mounted by a series of connecting levers to the movable solenoid cylinder 253 slidably passes through suitable apertures in side wall 19 and cam 156 and is capable of extending transversely beyond the inner surface of cam 156 and into the rotational path of surface 248 of the locking lever segment 245. When the solenoid 252 is activated, the cylinder 253 is drawn into the solenoid which through the connecting linkages moves the pin 251 beyond the face of cam 156 and into the path of movement of the locking lever segment 245. A collar 255 is fixedly secured to the portion of the pin 251 which extends outside wall 19 and a spring 256 is telescopically mounted over the pin 251 and is compressed between the collar 255 and side wall 19. Thus, as the solenoid 252 is deenergized, the spring 256 will move the pin 251 to the left as shown in FIG. 16 and out of the path of movement of the locking lever segment 245. As will be seen in FIG. 15, the pocket segment 50, crank 151 and cam follower 152 are moving in a counterclockwise direction and the locking lever 244 is in the dotted line position as it approaches the fixed cam 156. As the follower 152 contacts the surface of cam 156 the arm of crank 151 is moved clockwise until it reaches its downward depending position as determined by the high part of the cam 156. While the crank 151 is being held in said downward depending position, the continued movement of the pocket segment 50, the cam follower 152 and the locking lever 244 will cause the actuating surface 248 of the locking lever segment 245 to come into contact with the pin 251 and the locking lever 244 will be rotated clockwise to the solid line position and be retained in that position by the spring pressed ball 250. A stationary pin 257 extends horizontally inwardly along the inside surface of wall 19 a sufficient distance to be in the circular path of movement of the segment 245 of the locking lever 244. Pin 251 is also positioned such that it will contact the surface 247 of the segment 245 of the locking lever 244. Thus, as each pocket segment 50 rotates past the pin 257, the locking lever 244 is returned to its inactivated position as shown in the dotted lines in FIG. 15.

As discussed earlier, if each pocket 16 as it passes the jacket feed station and the insert station has received the proper number of newspaper sections for that pocket then said properly assembled newspaper sections are ejected from the stuffing wheel when the pocket is in alignment with the discharge station and onto the conveyor system 26. However, should the improper number of newspaper sections be fed into any one of the pockets 16 as each of said pockets passes the jacket feed station or the insert feed station then the misassembled sections in that particular pocket are not ejected from the stuffing wheel when that particular pocket comes into alignment with the discharge conveyor system 26, but rather the misassembled sections are retained within that pocket and are discharged upon a reject conveyor system 27. In order to accom-

plish this, solenoid 235 must be activated to permit ejector switch track 215 to be rotated and direct the ejector cam follower 188 associated with the pocket containing the misassembled newspaper sections along the cam surface 195 which is in effect a continuation of the surface of cam 189. It is also necessary to actuate the solenoid 252 so that pin 251 will be moved into operational position with respect to that pocket containing the misassembled newspaper sections. The mechanism for detecting the absence of less than or the presence of more than the required number of newspaper sections in any of the pockets 16 as each is rotated past the jacket feed station and then past the insert feed station comprises a caliper mechanism, to be hereinafter described, which is associated with each of the hoppers 13, 23, 37, 38 and 39. The operation of said caliper means transmits this information through electrical circuits to a memory wheel mechanism which in turn, through electrical circuits, actuates the solenoids 235 and 252 at the proper times and in the proper sequences. The solenoids 235 and 252, as described above, control the operation of the pocket eject mechanism and the lock mechanism for the pocket retaining fingers 240.

Since the caliper means associated with each of the hoppers 13, 23, 37, 38 and 39 are identical in construction and operation, a description of one will be sufficient for an understanding of all. This mechanism is best shown in FIGURES 16, 17, 18 and 19. Located directly beneath each of the hoppers and positioned to receive each newspaper section as it is fed out of the hopper is a pair of fixed and freely rotatable feed rolls 262 and a pair of cooperating freely rotatable and movable feed rolls 263. Feed rolls 262 are secured to shaft 264 one end of which is rotatably mounted in plate 10, the other end of which passes through plate 10 and is rotatably mounted in a spaced-apart plate 10'. A shaft 265 extends parallel to shaft 264 and has its ends mounted in suitable bearings in side plates 10 and 10'. Each of the feed rolls 263 is freely rotatably mounted in one end of a vertically extending support plate 266, the other end of which is secured to the shaft 265 as shown in FIG. 19. Also securely fastened to shaft 265 and adjacent the inner surface of a side wall 10 is a horizontally extending arm 267. A rod 268 having a collar 269 is pivotally mounted to the end of arm 267 and extends downwardly and slidably through a suitable opening in the rod support 270 which is securely attached to plate 10. A spring 271 is telescopically compressed between the top surface of support 270 and collar 269, thus, the shaft 265 is constantly urged counterclockwise and constantly urges roller 263 toward roller 262. Mounted parallel to shafts 265 and 264 is a shaft 272 having its ends rotatably mounted in suitable bearings in plates 10 and 10'. Shaft 272 is rotated by a driven gear 275. The gear 276 mounted on shaft 264 meshes with gear 275 to rotate shaft 264 and the fixed feed rolls 262. A cam 277 is secured to shaft 272 and controls the movement of movable feed rolls 263. As best shown in FIG. 16, a generally horizontally disposed connecting arm 278 is operatively secured at one end to the shaft 265 by the connecting link 279. A yoke 280 is formed in the other end of connecting arm 278 and passes over the shaft 270 and is held adjacent one surface of the cam 277. A cam follower 281 is rotatably mounted adjacent the yoke 280 on the connecting arm 278. Since the shaft 265 is spring urged in a counterclockwise direction, the cam follower 281 will constantly be urged into operational contact with the surface of cam 277. When the cam follower 281 is riding on the high part of cam 277, the rolls 263 are held a sufficient distance from rolls 262 to permit a jacket section to be gripped therebetween and to be fed downwardly. However, as the cam follower 281 reaches the low part of the cam, the rolls 263 are urged toward rolls 262 and the sheets of paper making up the jacket section are compressed between said rolls to their true thickness. It will also be observed that with a jacket section

between the bite of rolls 263 and 262 the cam follower 281 is held out of contact with the low part of cam 277. Since the folded edge B of each jacket section fed between rolls 262, 263 has a thickness greater than the thickness of the pages in the rest of each jacket section, it has been found desirable to permit this thicker folded edge to pass between said rolls before the rolls 263 are permitted to move toward rolls 262 under the force of the spring loaded shaft 265. This is accomplished by regulating the timing of the feeding mechanism in the hopper which is driven from shaft 272 and positioning the cam 277 on the shaft 272 such that the follower 281 will not go down into the low part of the cam until after the folded edge has passed between the bite of rolls 262 and 263. It will thus become apparent that after the folded edge B of each jacket section has been fed through the bite of rolls 262, 263, the rolls 263 will be spring urged toward rolls 262 and will measure the thickness of the jacket section. Also fixedly secured to shaft 265 and movable therewith is a generally horizontal caliper arm 282 having an electrically insulated brush portion 283 at its outer end. Mounted for vertical adjustment in suitable brackets on plate 10 and in the arcuate path of movement of the brush 283 are a pair of spaced apart electrical contact members 284, 285. Electrical contact members 284 and 285 are spaced apart vertically a sufficient distance to permit the brush 283 to move in an arcuate path in response to a jacket section having a normal thickness passing through rolls 262, 263 without touching either contact member 284 or 285. The allowable tolerances of newspaper sections being fed can be adjusted by moving the contact members closer together or further apart. Connected in series with the brush 283 and each of the contact members 284 and 285 is an electrical switch 286, best shown in FIG. 18, having an actuating button 287. Until switch 286 is closed by pushing button 287 to the left, the caliper circuit remains open. The mechanism for actuating the switch 286 comprises a cam 288 secured on shaft 272. A bell crank 289 is pivotally mounted on plate 10 and has a cam follower 290 rotatably mounted at the end of one arm. A spring 291 is attached to the end of the other arm of the bell crank and to the wall 10 to constantly urge the cam follower 290 into operative contact with the surface of the cam 288. A contact pin 292 is threadedly engaged in one arm of the bell crank 289 and is so positioned that it contacts the button 287 of the electrical switch 286 so that as the cam follower 290 rides up upon the high part of cam 288 the switch 286 is closed and when the cam follower 290 rides down upon the low part of cam 288 the switch 286 is opened. The cam 288 is so positioned on shaft 272 in relation to cam 277 and the feeding of jacket sections from each hopper that the high part of the cam closes the switch 286 after the folded edge B of the jacket section has been fed through the bite of rolls 262 and 263 and at the same time that the rolls 263 are spring urged toward rolls 262 as described earlier. It will thus be seen from FIG. 17 that if no jacket section is fed between rolls 262 and 263 or if a jacket section having a thickness less than the permissible thickness passes between rolls 262, 263, the roll 263 will move to the left a greater distance than normal which will in turn cause the brush portion 283 of the caliper arm 282 to be lifted upwardly and make an electrical contact with the contact member 284. Likewise, if a jacket section greater than the allowable thickness or if more than one jacket section is fed from the hopper between rolls 262, 263 the roll 263 will be moved to the right as shown in FIG. 17 thus causing the brush portion 283 of the caliper arm 282 to be moved downwardly into electrical contact with the contact plate 285. When a jacket section of the allowable thickness is passed between rolls 262, 263, the brush portion 283 of the caliper arm 282 will merely be moved up or down without making electrical contact with either contact plate 284 or 285. Even though the brush 283

is in electrical contact with either contact plate 284 or 285, the caliper circuit is still not closed until the switch 286 is closed which occurs after the folded edge of the jacket section has passed through the bite of rolls 262, 263 as described above. Therefore, should the folded edge of each jacket section passing through rolls 262, 263 cause the brush 283 to make electrical contact with either contact plates 284 or 285, the caliper circuit would still remain open since the switch 286 remains open until after the folded edge of each jacket section has passed through the bite of rolls 262, 263. In this manner, the caliper circuit can only be closed after the roll 263 is measuring the true thickness of each jacket section thereby eliminating false readings.

An electrical solenoid forming a part of the memory wheel, to be described hereinafter, is connected in series to the caliper circuit for each of the hoppers. In order to guide the jacket sections after they have been fed through the feed rollers 262, 263, there are provided a plurality of guide members 295 to guide and direct each of the jacket sections from the rolls 262, 263 into the bite of the feed rollers 14 in the case of the jacket sections. In the case of the single insert section with its hopper, the guide 295 would also direct each of the newspaper sections to be used as an insert into the feed rolls 24. In the illustrated embodiment showing multiple insert section hoppers, the guides 295 act to direct each insert section from its hopper onto the collecting conveyor 40. Each of the guides 295 have a shape as shown in FIG. 19 and are secured at their lower ends to one end of a supporting arm 296. The other end of each of the supporting arms 296 are securely fastened to a freely rotatable shaft 297 which has its outer ends rotatably mounted in suitable bearings in the plates 10. A control arm 298 is fixedly secured to the shaft 297 and adjacent the inner surface of one of the walls 10. The outer end of arm 298 bears against a stop pin 299 which is threadedly secured in a fixed support block. A spring member 300 is attached to the outer end of arm 298 and to the side wall 10 and holds the arm 298 in contact with the stop pin 299. The angle of inclination of the guides 295 is thereby controlled by adjusting the amount that the stop pin 299 protrudes beyond its support block. In order to prevent a badly mangled or crushed newspaper section from passing into the mechanisms of the stuffing wheel, there is provided a choke-up cut-off mechanism associated with the guides 295 for each hopper and comprising a choke lever 303 having a flat surface held approximately parallel to the guide 295 and a rearwardly extending arm portion which is securely attached to a shaft 304. The shaft 304 extends parallel to shaft 264 and has its ends rotatably mounted in suitable bearings in the side plates 10. A control arm 305 is secured to one end of the shaft 304 and extends vertically upwardly as shown in FIG. 19 with its upper end extending between an adjustable stop pin 306 and a control button 307 mounted on an electrical switch 308. Stop pin 306 is threadedly engaged in a suitable base which is secured to the inner surface of wall 10. A rod 310 having a shouldered portion 311 is horizontally disposed with one end freely passing through a slotted area in the arm 305 and having the opposite end pivotally secured to the wall 10. A spring 312 is telescopically mounted over the rod 310 and is compressed between the one surface of the arm 305 and the shoulder 311 thus constantly urging the arm 305 toward the adjustable stop pin 306 and away from the switch control button 307. The choke lever 303 is spaced apart from the surface of guides 295 a sufficient distance to permit a jacket section which exceeds the allowable thickness to continue along the guide 295 without touching or moving the choke lever 303. However, should a newspaper section become jammed or crushed so as to expand its thickness then as such a newspaper section slides down the guide 295 it will strike the choke lever 303 causing the lever to be pushed upwardly

which in turn would rotate the shaft 304 in a clockwise direction, as shown in FIG. 19, which in turn causes the arm 305 to be rotated in a clockwise direction thus pushing the pin 307 on the electrical switch inwardly to actuate said switch and cut off the motor and stop the machine.

The memory wheel, best shown in FIGS. 21, 22 and 23, is supported on a base 315 which is secured to and extends from the surface of side plate 10. Mounted on base 315 is a speed reducer 316 which is driven by suitable sprocket and chain drive from the main shaft 29. A shaft 317 extends outwardly from the output side of the speed reducer 316 and has mounted at its outer end the memory wheel 318. For clarity in description, the surface of the memory wheel 318 which is closest to the end plate 10 as viewed in FIG. 21 will hereinafter be referred to as the inner surface of said memory wheel and the opposite surface will be referred to as the outer surface of the memory wheel. An end plate 320 is held in a spaced apart position to the memory wheel 318 and longitudinally parallel thereto by a pair of brackets 319. A pair of side walls 321 are secured to brackets 319 and the base plate 315. A series of twenty pins 322 are equally spaced around the periphery of the memory wheel 318 and slidably extend transversely through suitable apertures in said memory wheel. Each of the pins 322 are of the same construction and operation and therefore a description of one will be sufficient for an understanding of all. Each pin 322 comprises a shaft portion 323 having a convex end portion and a convex head portion 324. A pair of parallel and spaced apart detent grooves 325 are formed in the peripheral surface of the shaft 323. A recess 326 extends radially inwardly from the peripheral edge of the memory wheel and extends transversely across the aperture which retains the pin 322. A pin 327 is mounted in the recess 326 and is pressed downwardly against the shaft 323 by a spring 328. Lateral movement of pin 322 is limited by the convex head 324 at one end of the pin and a collar 329 at the other end of the pin. It will be observed from FIG. 21 that when the pin has been moved so that the collar 324 is against the outer surface of the memory wheel, the detent pin 327 is retained in one of the detent grooves 325. For future reference this position of pin 322 will be referred to as position x. When the pin is moved in the opposite direction, the collar 329 is pressed against the inner surface of the memory wheel 318 and the detent pin 327 is pressed into the other detent groove 325. For future reference, this position of pin 322 will be referred to as position y. The detent 327 and the detent grooves 325 retain each pin 322 in either position x or y against movement due to ordinary vibrations of the machine or the rotation of the memory wheel 318. A pocket finger locking switch 331 having a pivotally mounted lever arm 332 and an ejection cam actuating switch 333 having a pivotally mounted lever arm 334 are mounted, by suitable brackets attached to end plate 320, so that the lever arms 332 and 334 are parallel to the inner surface of the memory wheel 318 and extend into the path of a pin 322 which has moved to position x upon rotation of the memory wheel. A counting switch 335, secured to end plate 320, has a pivotally mounted lever arm 336 which extends adjacent the outer surface of the memory wheel and into the path of movement of any pin 322 when said pin is moved to position y. Each of the switches 331, 333 and 335 are the type which remain normally open and each of the lever arms 332, 334 and 336 are spring loaded to be retained in their outwardly extending position when said switches are open, as shown in FIG. 22. Securely mounted to each of the switch lever arms is a downwardly extending pin which closes the switch upon downward movement and opens the switch upon upward movement. Therefore, it can be seen from FIG. 22 that a pin 322, which has been moved to position x, will upon being rotated past the lever arm

332 press said lever arm downwardly which will in turn close the switch. The switch 331 is electrically connected in series with the solenoid 252 and a source of power. When switch 331 is closed, solenoid 252 is actuated which in turn moves pin 251 into operative position. When pin 251 is in operative position, a finger 240 on the rotating stuffing wheel is locked in the manner described above. The switch 333 is electrically connected in series with a source of power and the solenoid 335 which controls the movement of the switching cam 215 on the pocket ejector system. Switch 335 is connected to a source of power and either to any well-known type of counter or to any well-known kicking mechanism, not shown, which when actuated will cause a completed newspaper on the conveyor to be knocked out of line. In this manner, any predetermined number of completed newspapers may be sequentially counted off.

Secured to the inner surface of end plate 320 and extending inwardly toward the outer surface of the memory wheel 318 are a plurality of pin actuating mechanisms generally designated as 337 and more clearly shown in FIG. 21. Each of the actuating mechanisms are identical in construction and operation and therefore a description of one will be sufficient for an understanding of all. Each pin actuating mechanism 337 comprises a solenoid 338 mounted on a bracket 340 and has a horizontally movable arm 339. Each bracket 340 is secured at one end to plate 320 and has at its other end a yoke portion 341 and a downwardly depending stop lug 342 which is horizontally offset from the yoke 341. A lever 345 is pivotally mounted at its center in the yoke 341 and is pivotally connected at its upper end by suitable linkages to the movable arm 339 of the solenoid 338. An anvil 346 is secured to the other end of lever 345 and is horizontally offset from said lever to be in the same plane as the stop lug 342. A spring 347 has one end secured to the bottom portion of lever 345 and its other end secured to the outer end of bracket 340 so that as long as the solenoid 338 is not energized, the lever 345 is urged in a clockwise direction until the rear of anvil 346 strikes the stop lug 342 and the arm 339 is held in its outermost extending position from the solenoid 338. It will also be observed from FIG. 21 that the contacting surface of the anvil 346 when the solenoid 338 is de-energized is held out of the path of movement of the pins 322 when the pins are in position y. When the solenoid 338 is energized, the arm 339 will be pulled to the right, as shown in FIG. 21, against the force of spring 347 and will cause the lever arm 345 to be rotated in a clockwise direction, thus moving the anvil 346 to the left. As long as anvil 346 remains in this position, any of the pins 322 which are in position y will be pushed to position x as it is rotated past the anvil. As described earlier, a pin 322 in position x, as it is rotated on the memory wheel 318, will actuate the lever arm 332 of the pocket finger locking switch 331 and also the lever arm 334 of the ejection switching cam actuating switch 333. The pin 332 will remain in position x until it is pushed outwardly by the pin reset plate 348. The pin reset plate 348 is mounted on the end plate 320 such that its inner surface extends inwardly and parallel to the inner surface of the memory wheel 318. The inner surface of plate 348 has a contour as shown in FIG. 23 and is spaced from the inner surface of said memory wheel such that the smaller thickness of said plate will contact the end of a pin 322 when said pin is in position x, while the thickest portion of said plate will contact the end of a pin 322 in position y. Thus, as each pin 322 is rotated past the pin reset plate 348 it will be pushed into position y, if it is not already in that position, so that each pin which has passed said reset plate will always be in position y. The memory wheel, as shown in FIG. 21, has all of the solenoid actuated pin pusher mechanisms that are required for six insert and one jacket feeder together

with the solenoid actuated pin pushing mechanisms which are required to run the six insert and two jacket feeders at half speed when it is so desired.

As described earlier, the memory wheel has twenty pins 322 equally spaced 18 degrees apart about its outer peripheral edge and the stuffing wheel 17 has twelve pockets 16 radially spaced 30 degrees on center lines about a common axis. The relationship of the memory wheel, the stuffing wheel, the jacket section and insert section hopper feeding and calipering mechanisms, and the insert section collection conveyor is a regulated timed speed relationship. The stuffing wheel makes  $1\frac{2}{3}$  revolutions to one complete revolution of the memory wheel. As the memory wheel makes a pin to pin or 18 degree movement, the stuffing wheel makes a pocket to pocket or 30 degree movement and at the same time each hopper feeding mechanism makes one complete cycle, i.e., the hopper feeding mechanism engages a newspaper section in the hopper, deposits it in the calipering rolls and returns to a position to engage the next newspaper section in the hopper to complete the cycle. The pin pushing mechanisms 337 are secured to the inner surface of end plate 320 and are arranged in an arcuate path with the anvils 346 thereof in the operational range of the path of movement of the pins when said pins are in position y on the memory wheel. There is a pin pushing mechanism 337 for each insert and jacket hopper. The calipering circuit for each insert and jacket feed mechanisms is electrically connected with the solenoid 338 of its corresponding pin pushing mechanism on the memory wheel. Each of the pin pushing mechanisms 337, as shown in FIG. 22, carries an identification wherein the first number indicates the position of that feed hopper in relation to the stuffing wheel, said hoppers being numbered from the stuffing wheel outwardly. For example, number one insert hopper is adjacent the stuffing wheel and number six insert hopper the furthest away from said wheel in the disclosed embodiment. The letter I indicates that the hopper is an insert section feed hopper and the letter J indicates that the hopper is a jacket section feed hopper. The third letter in the series on each pin pushing mechanism is either F for fast or normal jacket or insert hopper feeding speed or S for slow or one-half normal insert or jacket hopper feeding speed.

A pin to pin or 18 degree of memory wheel rotation equals 18 inches of travel of conveyor 40 and also equals 1 pocket or 30 degrees of stuffing wheel rotation. The insert feeders are located 46 inches apart and the insert feeder solenoids 337 on the memory wheel are located 46 degrees apart. The actuating solenoid for the number 1 insert feeder is located back from the ejector actuating switch 333 one degree for each inch that a conveyor lug travels from the time an insert is calipered in number one insert feeder to the time that the ejector is to work. Since the pocket finger locking switch 331 must be actuated before the affected pocket reaches the ejector, this switch is located on the memory wheel a suitable distance from the ejector actuating switch 333. It will thus be observed that each pin on the memory wheel represents a pocket on the stuffing wheel and also represents the collection of jackets and inserts deposited therein as each pocket is rotated past the jacket feed station and past the insert feed station. It will also be observed that an insert from number six insert hopper destined to be deposited in a particular pocket on the stuffing wheel has the greatest distance to travel and consequently is removed from its hopper and fed through its calipering mechanism before that particular pocket has been rotated into position to receive a jacket therein. For purposes of clearer illustration, the travel of one particular pocket on the stuffing wheel and the travel of a jacket section and six insert sections, which comprises a complete newspaper assembly will be described. As stated earlier, each pin represents the travel of a particular pocket through

its operational cycle. As shown in FIG. 22, as a particular pin passes the actuating solenoid 337 on the memory wheel for number six insert hopper an insert is being fed from its hopper, through the caliper mechanism and onto the collecting conveyor 40. If this insert is fed properly, or is of the proper thickness, then the solenoid 337 will not be actuated. However, if the fed insert is too thick or too thin as it passes through the caliper mechanism, then the solenoid 337 will be actuated and, as previously described, pin 322 will be moved into position y. When that pin moved to position y is rotated past switches 331 and 333 the contents of that pocket will not be normally ejected but will be retained in the pocket and discharged at the reject station in the manner described above. As this same pin is rotated sequentially past each of the other solenoids 337 for the other insert hoppers, the same co-ordination of parts occurs as for number 6 insert hopper and the same operation of solenoids occurs. Once a particular pin has been moved into position y by any of the solenoids 337, the contents of that pocket will be prevented from being normally ejected but will be retained in the pocket until it reaches the reject station. The actuating solenoid 337 for the jacket hopper, like the actuating solenoids for the insert hoppers, is positioned back from the ejector actuating switch 333 one degree for each inch that the jacket travels from the time it is calipered to the time that the ejector is to work.

When the insert hopper feeding and caliper mechanism are operated at one-half speed, they must be retimed with respect to the constant speed of the collecting conveyor 40 and the stuffing wheel. For this reason, the actuating solenoids 337' for each insert hopper and for the jacket section are added as shown in FIG. 22 and are referred to as S or one-half speed. The principal reason for the S or one-half speed operation of the hoppers is to compensate for the use of newspaper sections which are quite thick and hence the hoppers are emptied much faster. By reducing the speed of feeding from the hoppers, the same number of operators may keep the machine running. Of course, it is to be understood that with, for example, six insert section hoppers only three assembled sections would be inserted into an opened jacket section. In the same manner, two jacket section hoppers may be used and operated at one-half speed to permit an operator to keep these hoppers filled with extra thick newspaper sections which are to be used as a jacket section. In that case, the jacket section hoppers are arranged in the same manner as the multiple insert section feed hoppers together with a conveying means.

If desired, the reject cam 189 can be formed without the switch cam track 215 so that the contents of every pocket are ejected into the delivery rolls without regard to whether or not the ejected unit is or is not a perfectly assembled unit of newspaper sections. In such a modification, the caliper means associated with each hopper could be operatively connected to either stop the entire machine when a newspaper section is improperly fed or to actuate a signal for the operator to remove that group of newspaper sections.

As described earlier in the specification, as each pocket rotates past the jacket feed station a jacket section is inserted therein and as the pocket arcuately travels toward its uppermost vertical position, suckers 80 and 83 contact the jacket half D and pull the same into contact with the slanted wall 54 and the radially inclined wall 54 of the pocket and the finger 148 engages the upper edge of jacket half D to hold the same in this position. Jacket half D is held in this position during the arcuate movement of the pocket toward the insert station. During this latter movement of the pocket, the unrestrained jacket half E will fall by gravity against straight pocket wall 51 to open each jacket section into a generally V-shape for the reception of insert sections. To provide a more rapid and positive movement of jacket half E, there is provided

a stationary air nozzle 72 mounted so as to direct a blast of compressed air through the slotted portions 49 in the end wall 45 of the stuffing wheel at an angle in the direction of travel of the pockets. These blasts of air are so timed with the movement of the stuffing wheel that they occur at the moment that the finger 133 has completed its forward stroke wherein it has pushed the upper edge of jacket half D into contact with the slanted wall portion 54 of the pocket. This is also the moment that the pocket has reached its uppermost vertical position and has started toward the insert receiving station. A hose 73 is connected at one end to the nozzle 72 and at the other end to a source of compressed air (not shown). Operatively connected to the hose 73 is an electrically operated valve 74 of well-known construction to selectively shut off and open the flow of compressed air therein to the nozzle. Electrically connected to valve 74 is a timing mechanism of any well-known construction driven from the same source of power as the stuffing wheel and in timed relation thereto so as to transmit electrical impulses to valve 74 to open the same. In operation, each time that a slotted portion 49 of the stuffing wheel passes nozzle 72 the valve 74 opens and a blast of air from the nozzle is directed through said slotted portion and against the jacket half E and rapidly moves the same against the wall 51 of the pocket so that the jacket is opened into a V-shaped position.

While there has been shown what is considered to be the preferred embodiment of a newspaper stuffing machine, various changes and modifications may be made in the design and arrangement of the parts without departing from the spirit and scope of the invention. For a definition of the limits of the invention, reference is had primarily to the appended claims.

What is claimed:

1. A newspaper stuffing machine comprising a plurality of compartments radially spaced about a common axis and rotatable through a vertical orbit, a plurality of newspaper section handling means operatively positioned in spaced relation about said orbital path, said handling means comprising means to feed a first newspaper section into each compartment during travel, means to feed a second newspaper section into each compartment during travel, and means to receive said first and second newspaper sections when the same are simultaneously discharged from each compartment, means to open the first newspaper section in each compartment and to retain the same in opened position as it approaches the feeding means for said second newspaper section whereby said second section is inserted within said first section, means to close the first section upon the second section as the same approaches said discharge receiving means, means in each compartment to discharge the newspaper sections contained therein, and means to actuate said discharge means for each compartment as each is operatively aligned with said discharge receiving means, an alternate discharge station positioned beyond said first-mentioned discharge station, means to detect the proper feeding of said first and second sections, means responsive to the actuation of said detecting means to retain said misfed sections in the compartments past said first-mentioned discharge station and operative at said alternate discharge station to discharge the sections so retained in the compartments.
2. A newspaper stuffing machine comprising a plurality of compartments radially spaced about a common axis and rotatable through a vertical orbit, a first newspaper section feeding station, a second newspaper section feeding station and discharge receiving means for receiving the said sections when the same are discharged from each compartment, said first and second feeding stations and said discharge receiving means spaced about the vertical orbital path of said compartments and in operational proximity to the outer ends of said compartments as they travel in said vertical orbital path, means to feed a first newspaper section into each compartment during travel,

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means to open said first section during travel, means to insert a second newspaper section into said opened first section, means to close the leaves of said first section with the second section therebetween, means associated with each compartment to eject said assembled sections from the same as it is rotated into operative relationship with said discharge receiving means, said last-mentioned means comprising movable means on the bottom of each of said compartments and said means being radially movable toward the open end of each compartment whereby the newspaper sections in said compartment are ejected therefrom.

3. An apparatus for stuffing newspapers comprising a series of generally V-shaped compartments radially disposed about a common axis and rotatable through a vertical orbit, a jacket section feeding means, an insert section feeding means, and a discharge receiving means, all positioned about the orbital path of the outer radial ends of said compartments and in operative range thereof, each of said feeding means comprising a hopper to retain said sections, means to extract a section from the hopper and feed the same into a compartment in timed relation to the rotation of said compartments, said insert section feeding means comprising a plurality of hoppers arranged in a series, a conveyor means having a run thereof extending along said hoppers and wherein said run terminates in operational proximity to the orbital path of said outer radial ends of said compartments, means to remove a section from each hopper and deposit the same on said conveyor in timed relation to the movement of said conveyor whereby a section from each hopper is deposited one on top of each other on said conveyor, means to open and retain the leaves of each jacket section as each of said sections is being advanced to the insert feed station, means to operate said insert conveyor and said insert feed means in timed relation to the rotation of said compartments whereby an insert section from each insert hopper is assembled and simultaneously inserted into said opened jacket section in each compartment, means to release the leaves of said jacket section and close the same upon said insert section, means in each compartment to discharge the contents therefrom, and means to actuate each compartment discharge means in timed relation to the rotation of said compartments past said discharge receiving means.

4. A signature handling means comprising a plurality of compartments radially spaced about a common axis and rotatable through a vertical orbit, a first feed station, a second feed station and a discharge station, said stations being positioned within operational proximity to the vertical orbital path of said compartments, means to feed a signature into each of said compartments at said first feed station during rotation of the same, means to open each of said first fed signatures, a plurality of signature feed means positioned remote from said second feed station, means positioned within operational range of said plural feed means and said second feed station to sequentially collect a signature from each of said plural feed means, means to operate said plural feed means, said collecting means and to effect the rotation of said compartments in timed relation with each other whereby a signature from each of the plural feed means is assembled and inserted into each of said compartments and within each opened first fed signature, means operatively associated with each compartment to eject said assembled sections as the same is rotated into operative relationship with said discharge receiving means and comprising movable means at the bottom of each of said compartments, said ejection means being radially movable toward the open end of each compartment whereby the signatures are ejected therefrom.

5. A newspaper stuffing mechanism comprising a plurality of V-shaped compartments radially spaced about a common axis and rotatable through a vertical orbit, a first feed station, a second feed station and a discharge station

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spaced in operational proximity to the vertical orbital path of the outer ends of said compartments, means to feed a newspaper section into each compartment at said first feed station during rotation of said compartments, means to open each of said first fed newspaper sections, means to feed a second newspaper section into each opened first section, means to receive said assembled first and second newspaper sections when the same are simultaneously discharged from each compartment, means to move and retain the leaves of said first newspaper section closed upon said second section as the same approaches said discharge receiving means, means in each compartment to discharge the newspaper sections contained therein, and means to actuate said discharge means for each compartment as the same is operatively aligned with said discharge receiving means.

6. A newspaper stuffing mechanism comprising a plurality of V-shaped compartments adjoining each other and radially extending outwardly from a common axis and rotatable through a vertical orbit, a first feed station, a second feed station and a discharge station, said stations being positioned within operational proximity to the vertical orbital path of said compartments, means to feed a newspaper section into each of said compartments at said first feed station during the rotation of the same, means to open each of said first fed newspaper sections, a plurality of newspaper section feed means positioned remote from said second feed station, means positioned within operational range of said plural feed means and said second feed station to sequentially collect a newspaper from each of said plural feed means, means to operate said plural feed means, said collecting means and the rotation of said compartments in timed relation with each other whereby a newspaper section from each of the plural feed means is assembled and inserted into each of said compartments and within each opened first section, each of said compartments having ejecting means and retaining means, control means for deactivating the ejecting means and activating the retaining means comprising means associated with each of the first and plural feed means and operatively connected to said ejecting and retaining means whereby when a newspaper section which is too thick or too thin is fed it will deactivate the eject mechanism and activate said retaining means for the compartment containing the defective assembly.

7. A newspaper stuffing mechanism as set forth in claim 6 including an auxiliary discharge receiving means and means to deactivate said retaining means as each compartment moves into operational alignment with said auxiliary discharge receiving means whereby the newspaper sections retained therein are deposited upon said receiving means.

8. A newspaper stuffing machine as described in claim 2 including means positioned at the side of each compartment to engage an edge of each of said first sections fed thereto and to move the same into contact with the opposite side wall of each compartment.

9. A newspaper stuffing machine as described in claim 2 wherein the means to open said first section comprises suction means and finger holding means to hold one leaf of said first section and located at the top edge of the trailing wall of each compartment, means to press the top edge of both leaves of said first section against the suction means as each compartment approaches the highest point in its vertical orbital path, means to actuate said suction means when the leaves are pressed into contact therewith, means to move the press down means out of operational position after said suction means has been actuated, means to cause the other leaf to be moved into contact with the leading wall of the compartment as each compartment passes the highest point in its vertical orbit, means to actuate said finger holding means to engage the upper edge of the leaf engaged by said suction means and to hold the same until after said compartment has passed said signature feed station.

10. A newspaper stuffing machine as described in claim 9 wherein the means to cause said other leaf to be moved into contact with the leading compartment wall comprises stationary means to direct a stream of air into said compartment toward said leading wall from said trailing wall and means to control the stream of air in timed relation to the movement of said compartments.

11. A newspaper stuffing machine as described in claim 2 including means to actuate said first section closing means after the second section has been fed into said compartment and before the compartment approaches said discharge receiving means.

12. An apparatus for stuffing newspapers comprising a series of compartments radially arranged about a common axis and rotatable through a vertical orbit, a plurality of newspaper section feeding means operative at stations placed about said orbit and adapted to feed into each compartment during travel a first newspaper section and thereafter a second newspaper section, means for opening said first section into a V-shape and for retaining the same in said position until after said second section has been fed into said opened section, means to feed said second section into said opened section, means to close said first section upon said second section, means to cause said assembled sections to be ejected from each compartment upon each thereof reaching a predetermined discharge station beyond said feeding stations, an auxiliary discharge station beyond said first-mentioned discharge station, means responsive to the absence of the feeding of a first or second section to deactivate the ejecting means at said first-mentioned discharge station for the compartment containing the misfed sections, means to retain said misfed signatures in said compartment and operative only when said ejecting means is deactivated whereby said misfed sections are retained in a compartment until reaching said auxiliary discharge station, and means at said auxiliary station for operating said misfed signature retaining means whereby said misfed sections will fall out of said compartment by gravity.

13. An apparatus as described in claim 12 wherein said ejection means at said first-mentioned discharge station comprises a radially reciprocable bottom portion for each compartment.

14. An apparatus as described in claim 13 including cam means for imparting reciprocable movement to said movable bottom.

15. An apparatus as described in claim 14 wherein each movable bottom portion is operatively connected to a cam follower, and wherein said cam is circular and has a guided follower path deviated from said circular path at the point corresponding to the positioning of said compartment in operative alignment with said first-mentioned discharge station whereby when said follower is directed into said guided path the movable compartment bottom portion is moved toward the open end of the compartment thus ejecting the assembled sections contained therein.

16. An apparatus as described in claim 15 wherein the means to deactivate the ejecting means at said first-mentioned discharge station comprises a movable cam switch for preventing said follower from entering said deviated guided path wherein said follower remains in contact with the surface of the circular cam so that the movable compartment bottom portion remains stationary.

17. An apparatus for stuffing newspapers comprising a series of compartments radially disposed about a common axis and rotatable through a vertical orbit, a jacket section feeding means, an insert section feeding means, a compartment discharge receiving means, and an auxiliary discharge receiving means positioned about the orbital path of the outer radial ends of said compartments and in operative range thereof, each of said feeding means comprising a hopper to contain said sections, means to extract a section from the hopper and feed the same into a compartment in timed relation to the rotation of said compartments, caliper means operatively associated with each of said feed means and movable between preselected limits corresponding to the thickness of each section fed thereby, compartment ejecting means associated with each of said compartments, means to operate said compartment ejecting means, retaining means selectively movable across the outer radial end of each compartment, means to operate said retaining means, and means responsive to the movement of each of said caliper means beyond said preselected limits to deactivate the compartment ejecting means and to activate the retaining means for the compartment into which the defective section has been fed whereby the sections in said compartment are not ejected on the discharge receiving means but are retained in said compartments.

18. An apparatus as set forth in claim 17 including means to deactivate said retaining means as said compartment approaches the auxiliary discharge receiving means whereby said sections are discharged from said compartment.

19. In apparatus of the character described comprising a plurality of section retaining compartments arranged to travel in a predetermined path, a first section feed means, a second section feed means and a discharge receiving means each spaced apart from the other and positioned in operative relationship to the path of travel of said compartments, each of said compartments having section ejecting means and section retaining means operatively associated therewith, control means including an electrical circuit and a first switch for deactivating said ejecting means and a second switch for actuating said section retaining means, and timed delay means associated with each of said first and second feed means for measuring the thickness of each fed section and movable between predetermined limits whereby movement beyond said limits closes said first and second switches of said control means as the compartment containing said measured defective section approaches said discharge receiving means.

20. An apparatus as set forth in claim 19 including an auxiliary discharge receiving means and means to deactivate said section retaining means as each compartment approaches said auxiliary discharge receiving means.

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