Feb. 1, 1927. 1,616,061

G. W. NELSON

NEWSPAPER INSERTING APPARATUS

Filed June 14, 1926 4 Sheets-Sheet 1

FIG. 4.

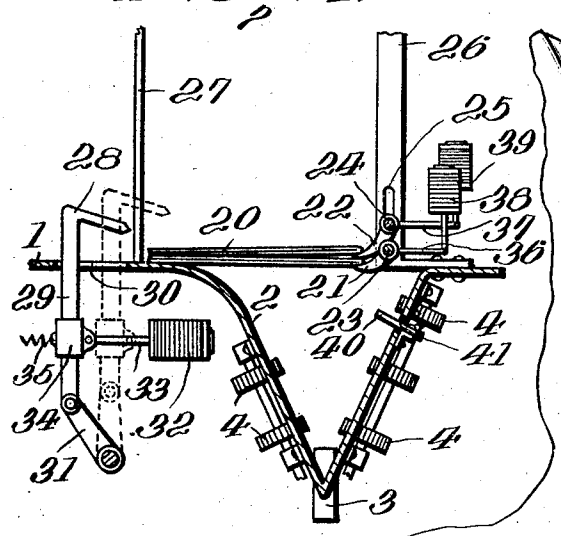


FIG. 1.

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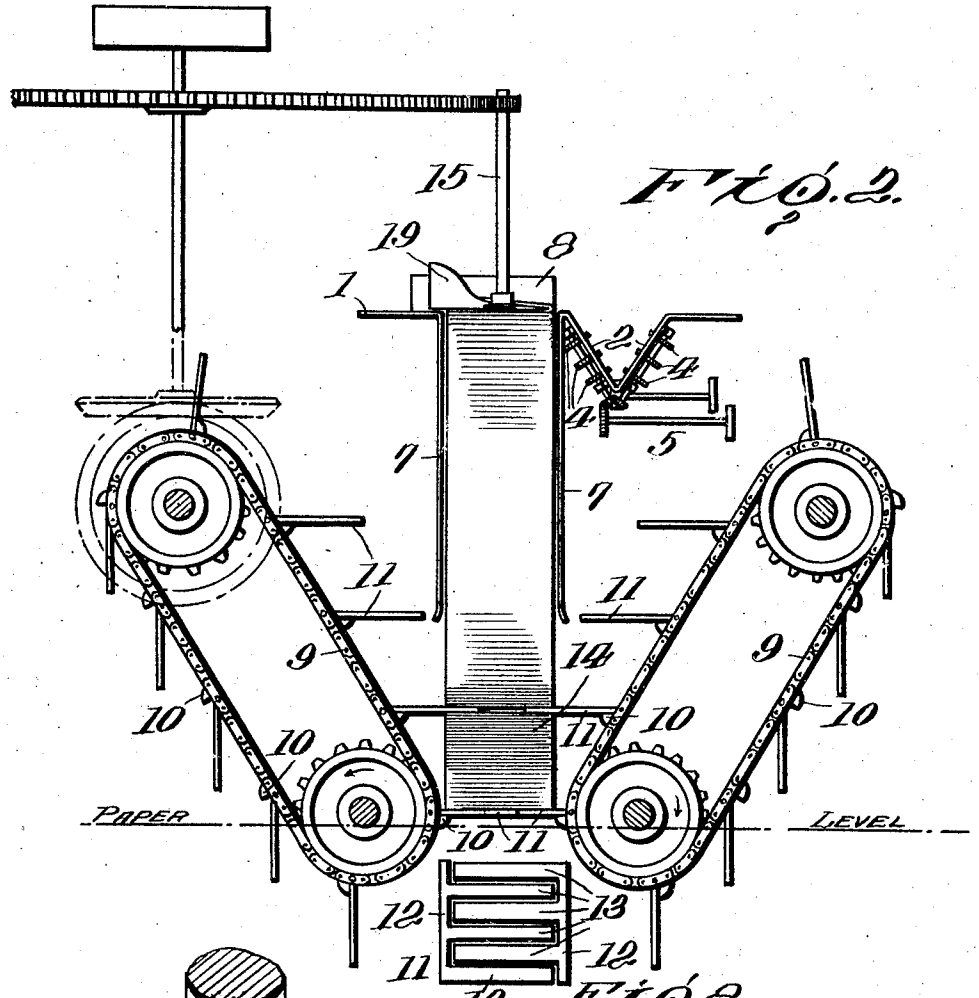


Fig. 2.

Fig. 3.

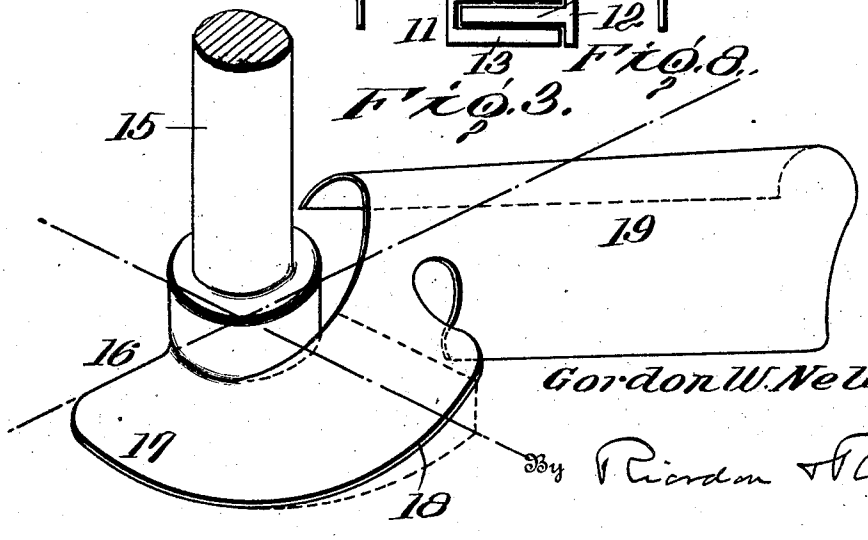


Fig. 8.

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Fig. 5.

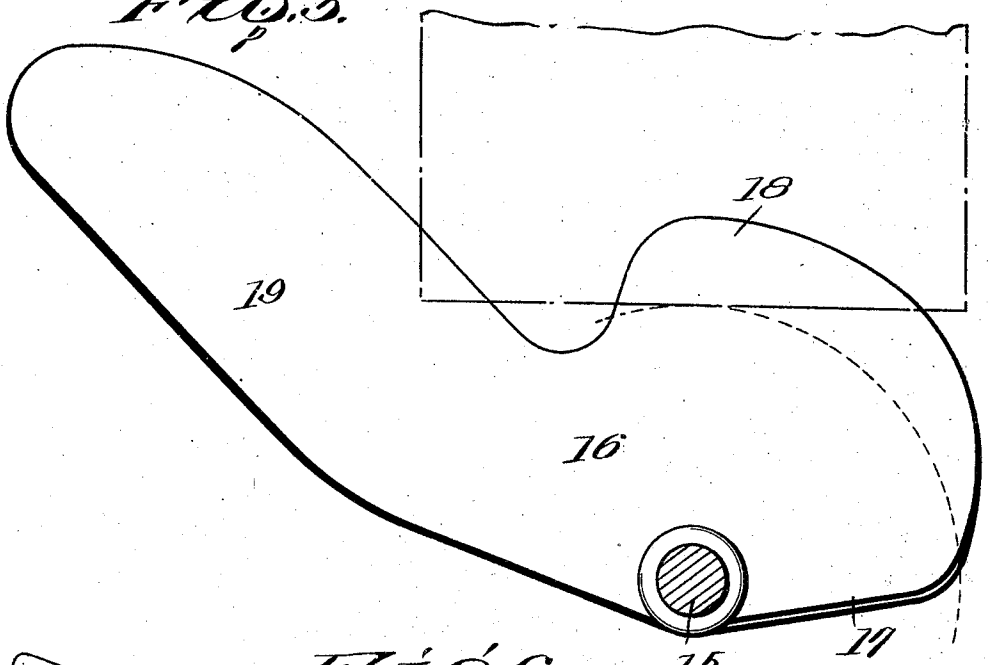


Fig. 6.

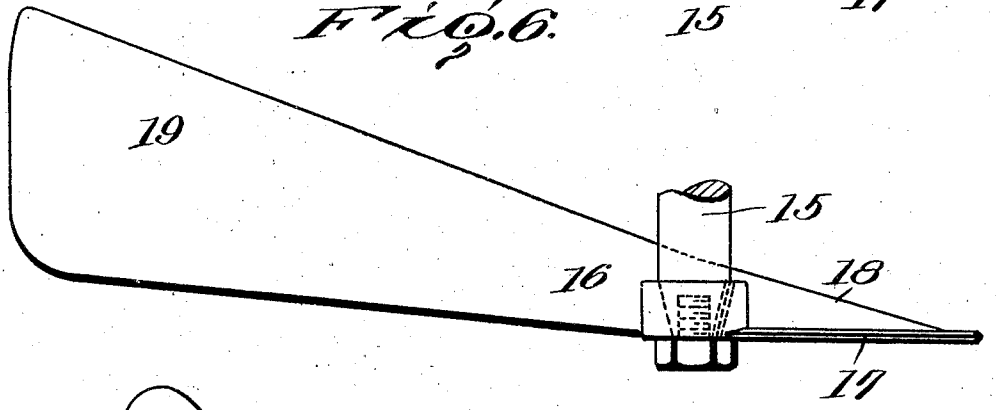
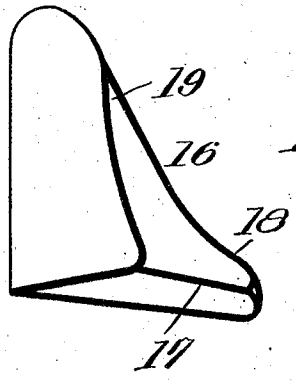


Fig. 7.



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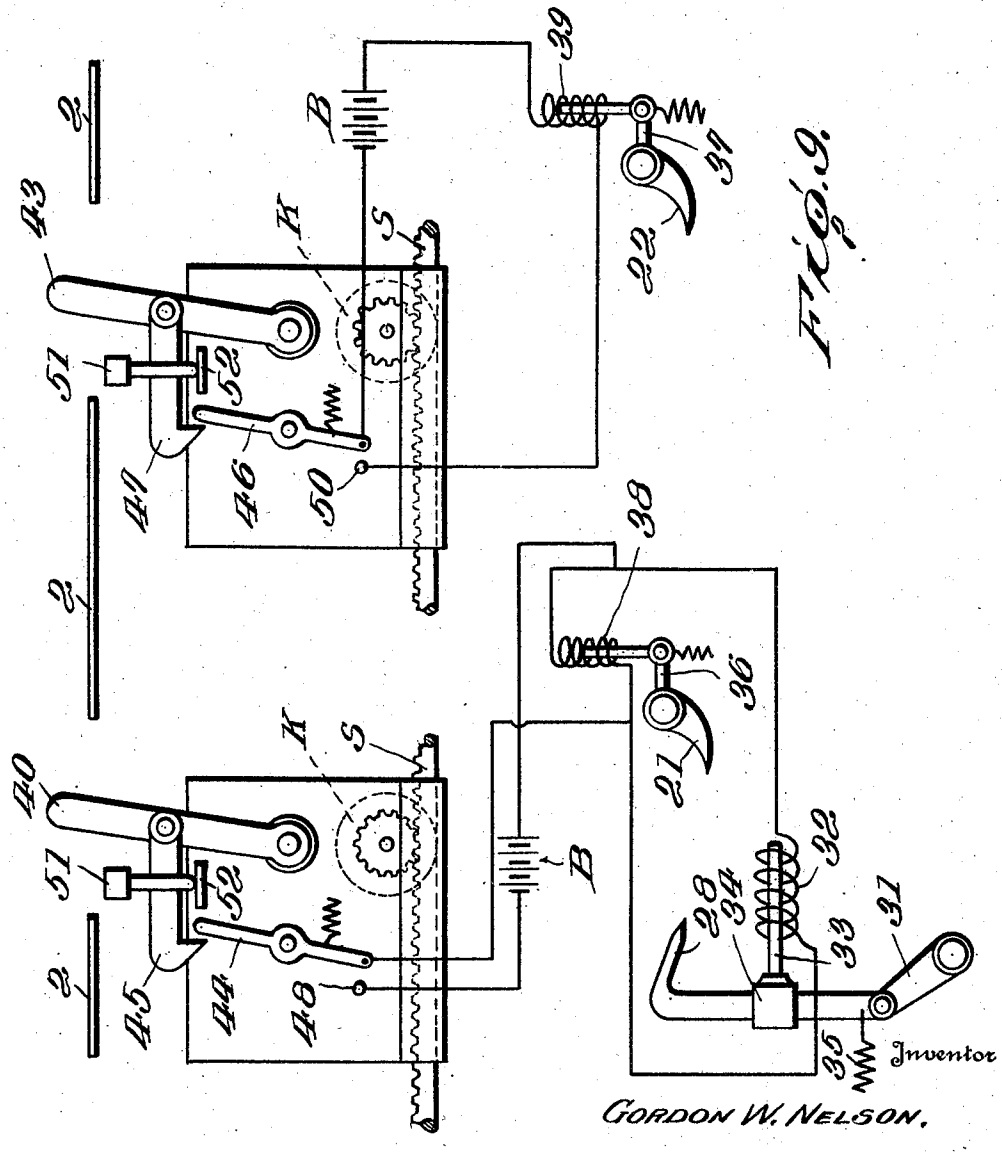


FIG. 9.

Inventor

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Patented Feb. 1, 1927. 1,616,061

UNITED STATES PATENT OFFICE.

GORDON W. NELSON, OF PHILADELPHIA, PENNSYLVANIA.

NEWSPAPER-INSERTING APPARATUS.

Application filed June 14, 1926. Serial No. 115,384.

This invention relates to newspaper stuffing machines, the term "stuffing" being applied in the parlance of newspaper workers to the operation of inserting folded sections of a newspaper into another section so that the latter envelops the former and the complete paper will be delivered as a unit. It is well known that the several parts or sections of a newspaper are delivered by separate presses, and, in the Sunday editions of large newspapers, sections are printed in advance of the day of issue and shipped to other cities to be combined with locally printed sections. These different sections must, of course, be assembled into one unit and, prior to my invention, no satisfactory commercial machine for doing this work has been produced.

My invention provides a simple and efficient apparatus whereby the main or enveloping sections are successively fed to a conveyor, opened and deposited in the conveyor to receive the other sections, the placing of the inner sections being accomplished successively as the enveloping section travels with the conveyor, and the outer enveloping section being automatically closed about the inner sections at the end of the conveyor.

The invention is illustrated in the accompanying drawings and will be hereinafter fully described, the novel features being particularly pointed out in the appended claims:

In the drawings:

Figure 1 is a plan view illustrating an apparatus embodying the invention;

Fig. 2 is an end elevation of the same;

Fig. 3 is a perspective of the opener and pusher;

Fig. 4 is a detail transverse section;

Fig. 5 is a plan view of the opener and pusher shown somewhat diagrammatically;

Fig. 6 is a similar diagrammatic rear elevation of the same;

Fig. 7 is a diagrammatic end view thereof, as viewed from the rear of its free end; and

Fig. 8 is a detail plan view of a portion of the means for raising the main folded sections of the newspaper.

Fig. 9 is a diagrammatic view of the trippers and solenoids, showing wiring of same, to be hereinafter described.

In the drawings, the reference numeral 1 indicates a table or platform in which is provided a longitudinal trough 2 which is V-shaped in cross section, whereby it will support the open section in proper position to receive the inserted sections. At frequent intervals in the bottom of the trough are mounted rollers 3 which receive the bight of the paper section and are constantly rotated so as to feed the section along the trough. Additional rollers 4 are mounted in the sides of the trough to support and feed the paper and these latter rollers are arranged in series, as shown. All these rollers have their peripheries covered with rubber or other material to effectively engage the paper and they may be rotated by any approved means, driving shafts being indicated conventionally at 5.

The sections which are to be utilized as the cover sections are fed upwardly to the table 1 and are received in a recess 6 therein immediately adjacent one side of the trough. Guides 7 may depend from the sides of the recess to prevent lateral movement of the upwardly moving papers, and a back stop or rail 8 is erected on the table at the inner end of the recess to prevent a paper being pushed rearwardly when engaged by the opening element. Below the table and at opposite sides of the guides 7 are arranged elevators comprising parallel endless chains 9 arranged in upwardly diverging relation and each having stop lugs 10 thereon at equal intervals. Adjacent each stop lug, a lifter 11 is hinged or pivoted to the companion chains, the lifters comprising cross bars 12 and fingers 13 projecting therefrom. The lifters are so arranged that on the downward runs of the chains they will hang freely therefrom but on the upper runs they will extend horizontally toward the planes of the guides 7, being held in that position by the stop lugs. As the lifters travel around the lower bights of the chains they are swung into horizontal planes by the stop lugs, corresponding plates on the two sets of chains meeting with the fingers 13 alternating, as shown in Fig. 8, to form a shelf for receiving and supporting a bundle of papers or sections. Modern printing machines deliver newspapers or sections folded once and in uniform bundles, generally containing fifty copies, and the lifters 11 are so arranged and the action so timed that two

lifters will meet just as a bundle is about to leave the conveyor bringing it from the printing machine. The bundle is caught by the meeting lifters and at once started upward toward the table 1. As the upper runs of the elevator chains diverge upwardly, the lifters 11 will gradually withdraw laterally from the bundle and will be entirely free by the time the bundle enters between the guides 7 but before this occurs a second bundle will be in position below the first bundle and will support the same, all of which will be understood upon reference to Fig. 2 in which the paper sections are designated 14.

Arranged at the front end of the recess 6 is means for opening the sections 14 and pushing them into the trough 2. In the illustrated arrangement, a vertical shaft 15 is disposed above the table with its lower end at the front end of the recess, and secured upon the lower end of the shaft is a helical or propeller-like blade 16 having an entering edge 17 which is flat and adapted to readily enter the fold of the uppermost section or paper 14 by a cam-like radial advance as the shaft rotates. The flat entering end portion 17 merges into an inclined portion 18 of constant pitch which lifts the upper leaf of the fold and is followed by a lateral arm 19 which extends to a greater radial distance from the shaft and has its working face at its free end much higher than the intermediate lifting portion 18, so that the arm will continue the opening movement and will push the open paper or section into the trough where it will be supported in open position by the downwardly converging sides of the trough. It will be understood that the sections are arranged with the folds or creases presented to the trough so that the opening movement is toward the trough and when the paper or section is fed into the trough the fold or crease will rest on the rollers 3. The back stop 8 prevents the sections or papers being shoved rearwardly over the table, and the moving parts are so sychronized that a section is folded and pushed into the conveyor trough with each revolution of the opener shaft and the intervening interval is just sufficient to permit a folded sheet to be brought into the recess 6 and the plane of the opener.

The folded sections 20, which are to be inserted in the sections 14 are arranged in piles over the trough and are partly supported by one side of the trough, the unfolded edges resting on the edge of the table, as shown in Fig. 4, and the folds being disposed directly over the trough and supported by dogs or latches 21, 22. Said dogs or latches are secured to lower and upper shafts 23, 24, respectively, and have their free ends arranged to engage under the folded edges of the lowest section and the next superposed section, as shown in Fig. 4. The shafts are mounted in vertical slots 25 in the guides 26 so that they may be set to accommodate the thickness of the folded sections, and the dogs are staggered, as shown in Fig. 1, so that they will not interfere with each other. The folded sections are piled between the vertical guides 26 at one side of the trough and the guides 27 at the opposite side of the trough, and separators or spreaders 28 are provided at the latter side to take the weight off the lower sections when a section is to pass into the trough. The spreaders or separators each consists of a head adapted to enter between two sections and carried at the upper end of a shank 29 which extends through a slot 30 in the table and is, in turn, carried by a rocking arm 31 below the table. The shank is drawn to the pile of folded sections by a solenoid 32, the core 33 of which is attached to a collar 34 slidably mounted on the shank, and a contractile spring 35 is attached to said collar to withdraw the shank from the pile of sections. The shafts 23, 24 are provided with crank arms 36, 37 to which are connected the cores of solenoids 38, 39, respectively, and the circuits through these solenoids and the solenoid 32 are controlled by a trip 40 which is mounted in a longitudinal slot 41 in the trough and disposed in the path of the section 14, advancing along the trough, to be actuated by said section. Two of these tripper-solenoid units will be required as shown in Fig. 9. Each one of these units can be adjusted in a longitudinal direction by a knob K along a horizontal shaft S having gear grooves on its upper surface. This adjustment is for the proper timing in dropping the inserts.

The open sheet travels down the trough and strikes trip 40 bringing arm 44 into contact with switch member 48 and operating a solenoid. An instant later, as the open sheet travels further along the trough, it strikes trip 43 bringing arm 46 into contact with switch member 50 and operating solenoid 39 which in turn actuates dog 22. Latches 45 and 47 are adjustable by screws 51 and lug 52 so that as they are drawn to the right they release arms 44 and 46 (after these arms have made contact through 48 and 50 respectively); so that these arms are returned by their respective spring, and the solenoids 38, 32 and later 39 are de-energized.

When a section of the open cover paper has passed, in the trough, trips 40 and 43 are brought to the left by suitable springs (not shown) and latches 45 and 47 then again engage the arms 44 and 46 respectively.

B is a battery or other source of electrical current which operates solenoids 38, 32 and 39. By adjusting the trip along the slot it

may be easily set according to the length of the cover section, and the chance of the inserted sections overlapping successive cover sections will be thereby eliminated. When the trip is actuated by impact from a cover section, a portion of the trip 40 first makes contact and closes the circuit through the solenoid 32 and then a moment or so later solenoid 38. When the circuit through solenoid 38 is broken and the dog 21 returns to normal position, that energizes solenoid 39, which permits another insert to drop to dog 21.

The solenoids 38 and 39 are energized so that the dogs 21 are rocked downwardly to release the lowest section and then returned to place. As the dog 21 returns to normal position, the dog 22 will rock downwardly so that the section supported by said dog will drop to be engaged and supported by the dog 21, the dog 22 returning to normal position and engaging the next superposed section. It will be thus seen that only one section can be discharged at one time. It will be noted, upon reference to Fig. 4, that the unfolded edges of the sections rest upon the flat table at the side of the trough and the weight of the pile of sections is sufficient to prevent the lowest section sliding from the table into the trough. This difficulty is overcome by the spreaders or separators 28. When the dogs 21 rock downwardly to release the lowest section, the spreaders move to the pile of folded sections and their heads enter between sections near the bottom of the pile and thereby separate or spread the pile vertically so that practically all the weight is taken off the lowest section which may then slide into the trough. As the dogs 21 return to normal position, the spreaders withdraw and the pile of sections may then move toward the table by gravity.

The assembled sections are caused to travel through the trough by the action of the rollers 3, 4, and the sides of the trough are overhung, as indicated at 42, or otherwise made to approach at the discharge end whereby the sides of the cover section are closed upon the inserted sections and the assembled sections discharged as a unit. It will be understood that any number of sections may be inserted or "stuffed" into the cover sections, it being necessary only to provide as many stations along the trough as there are sections to be inserted, and the insertion of the additional sections does not have any effect on the speed with which the assembled units are delivered.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a newspaper-stuffing machine, an opener blade having a flat thin entering edge and an upwardly inclined portion into which the entering edge merges.

2. In a newspaper-stuffing machine, an opener blade having a flat thin entering edge and an upwardly inclined helical portion into which the entering edge merges.

3. In a newspaper-stuffing machine, an opener blade having a flat thin entering edge, an intermediate upwardly inclined portion into which the entering edge merges, and a terminal pusher arm extending laterally and upwardly from the intermediate portion.

4. In a newspaper-stuffing machine, an opener blade having a flat thin entering edge, an intermediate upwardly inclined helical portion into which the entering edge merges, and a terminal pusher arm extending laterally and upwardly from the intermediate portion.

5. In a newspaper-stuffing machine, the combination of means for feeding folded sections to and past an assembling point, means for opening the sections successively as they travel to the assembling point, and means at the assembling point for inserting a section between the sides of the opened section.

6. In a newspaper-stuffing machine, the combination of means for feeding folded sections to and past an assembling point, means for opening the sections successively as they travel to the assembling point, and means at the assembling point for inserting a section between the sides of the opened section, and means beyond the assembling point for closing the opened section about the inserted section.

7. In a newspaper-stuffing machine, the combination of means for continuously lifting a pile of folded newspaper sections, means for opening the uppermost section and moving it from the pile of sections, means for conveying the opened section to a point of discharge, and means for depositing another section within the opened section as the latter passes to the point of discharge.

8. In a newspaper-stuffing machine, the combination of means for supporting a folded newspaper section on its side, means for lifting the upper leaf of the section to open the section, means for removing the opened section to a point of discharge, and means for inserting another section between the leaves of the opened section as the latter travels to the point of discharge.

9. In a newspaper-stuffing machine, the combination of means for supporting a folded newspaper section on its side, a rotary blade arranged to enter between the leaves of the section and lift the upper leaf, an element moving with the blade to push the opened section aside, means conveying the opened section to a point of discharge, and means for depositing another section upon the opened section as the latter passes to the discharge point.

10. In a newspaper-stuffing machine, the

combination of vertical guides, a pair of upwardly diverging endless conveyors having their lower bights arranged below and at opposite sides of the guides, lifting plates carried by the conveyors and disposed to lie in horizontal planes on the upper runs of the conveyors, the plates having interengaging fingers meeting between the lower bights of the conveyors to support and lift a pile of folded newspaper sections and gradually withdrawn from the sections as the sections move upwardly between the guides, means at the upper ends of the guides for opening the top section and moving it from the pile of sections, means for conveying the removed open section to a point of discharge, and means for depositing another section within the open section as it passes to the point of discharge.

11. In a newspaper stuffing machine, the combination of a conveyor-trough, means for delivering folded newspaper sections at the side of the trough, means for opening the sections and pushing them successively into the trough to rest at their creases therein, means for causing the opened sections to travel along the trough, means for supporting other sections over the trough, and means for releasing said supporting means whereby to deposit a section upon the opened section in the trough.

12. In a newspaper-stuffing machine, the combination of a trough, means for effecting travel of opened newspaper sections along the trough, means for retaining other sections in superposed relation over the trough and resting at one edge upon the side of the trough, means to releasably support the opposite side edge portions of the superposed sections and permit them to pass singly into the trough, and means to relieve the lowest sections of the weight of upper sections to facilitate the passage of the lowest sections into the trough.

13. In a newspaper-stuffing machine, the combination of a trough, means for effecting travel of opened newspaper sections along the trough, means for retaining other sections in superposed relation over the trough and resting at one edge upon the side of the trough, upper and lower dogs adjacent the opposite side of the trough engaging respectively under the edges of the section next to the bottom and at the bottom, said dogs being operable to feed the sections singly and successively into the trough, and spreaders at the side of the trough opposite the dogs to engage and spread the sections vertically as the lowest section is released by the lower dogs.

14. In a newspaper-stuffing machine, the combination of means for effecting travel of opened newspaper sections, releasable means for supporting other sections over the path of the traveling sections, and a trip operable by the traveling sections and controlling said releasable means whereby to effect deposit singly and successively upon the successive traveling sections.

In testimony whereof I hereunto affix my signature.

GORDON W. NELSON.