

April 7, 1942.

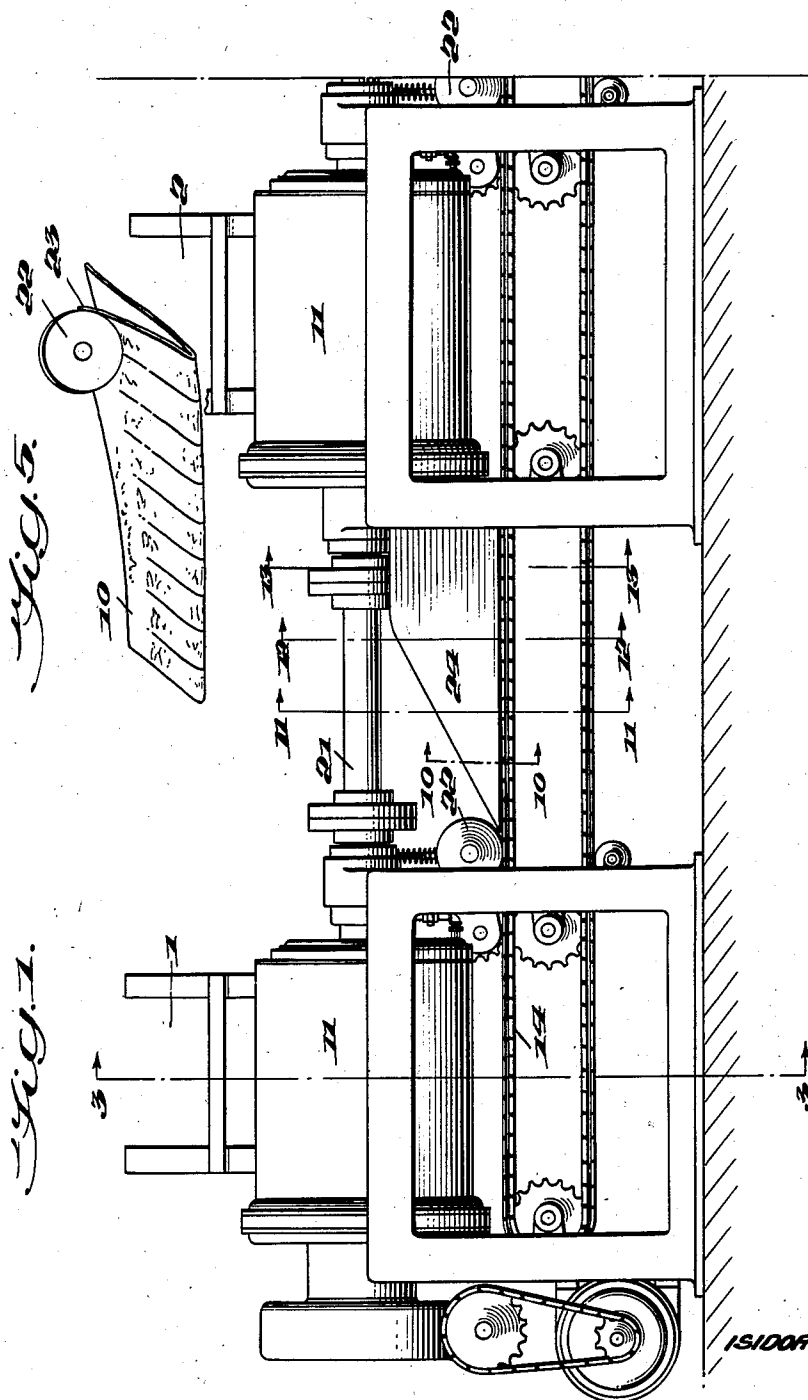
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ROTARY STUFFING MACHINE

Filed Feb. 15, 1940

6 Sheets-Sheet 1



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ROTARY STUFFING MACHINE

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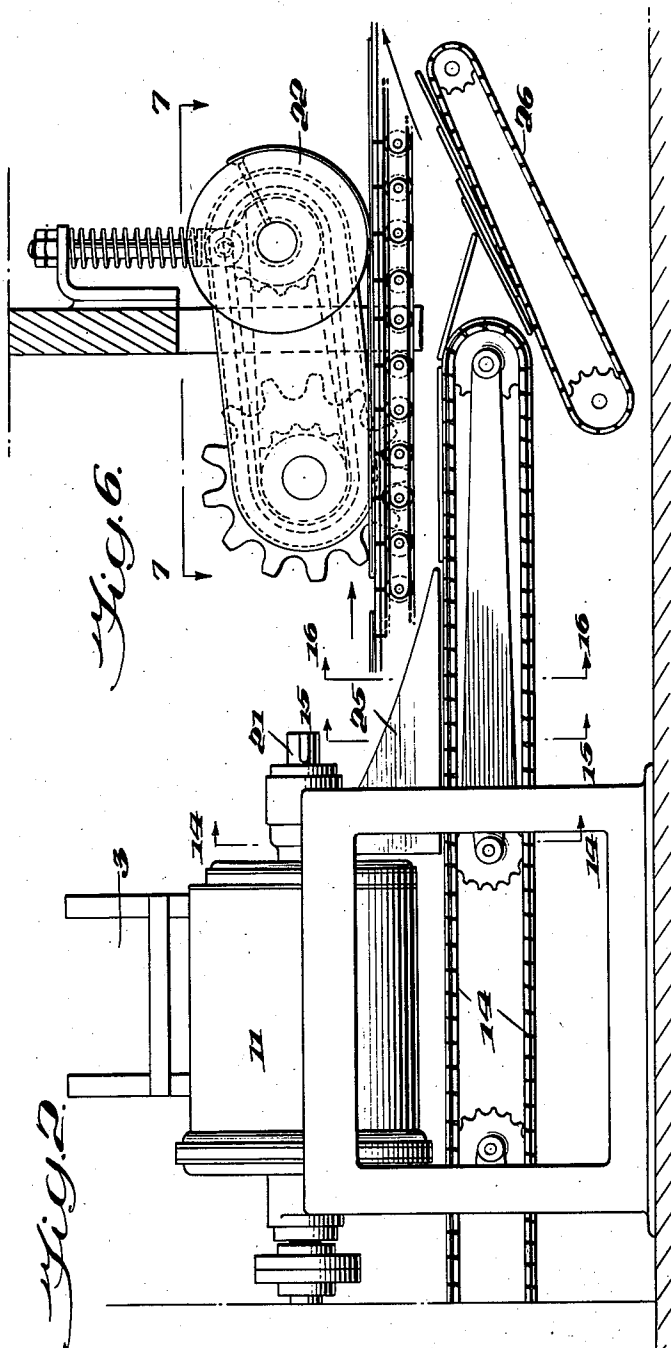


Fig. 6.

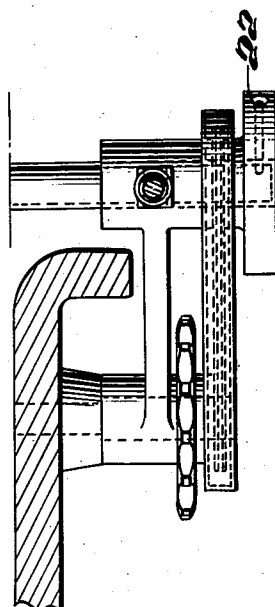


Fig. 7.

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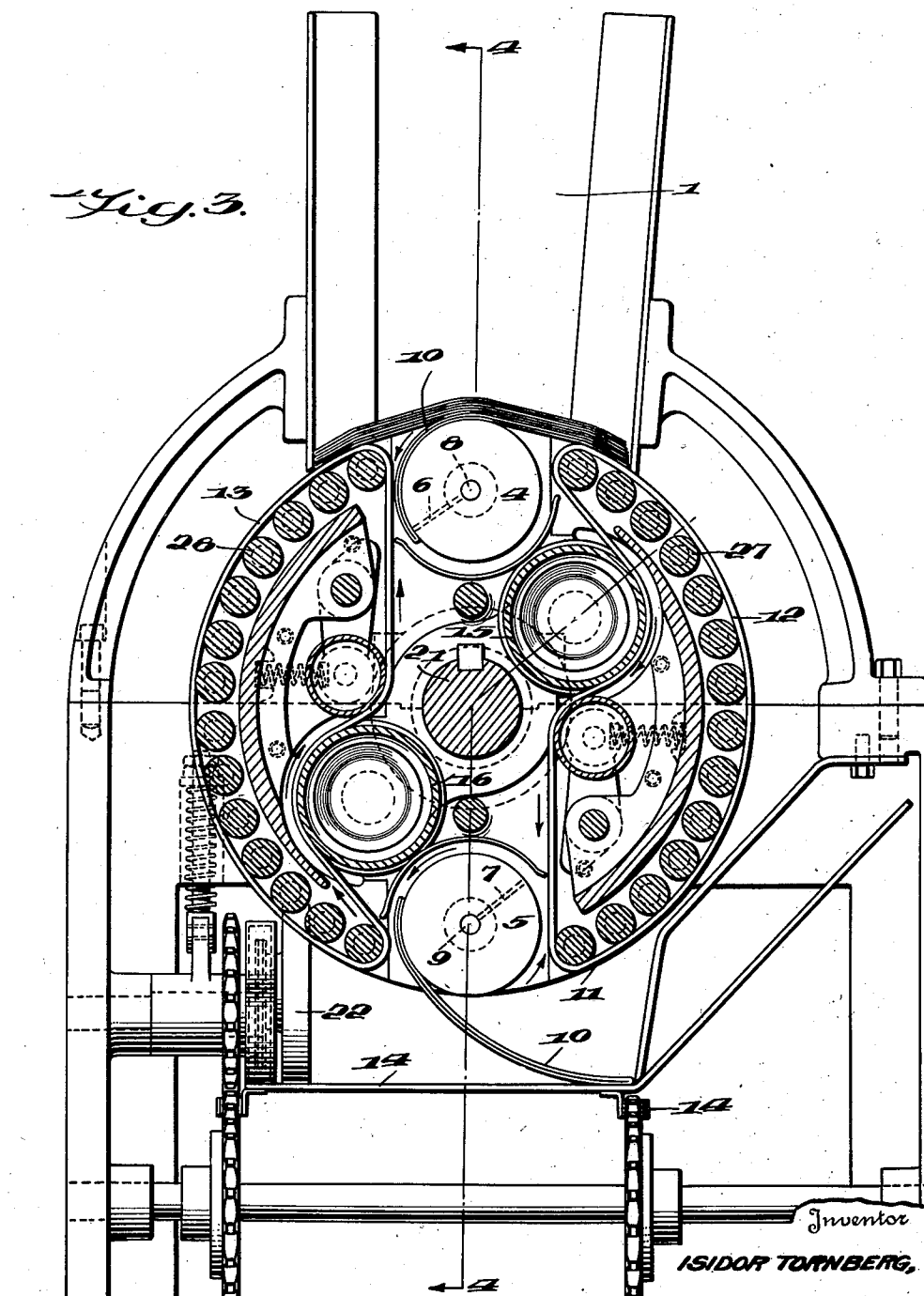
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Fig. 3.



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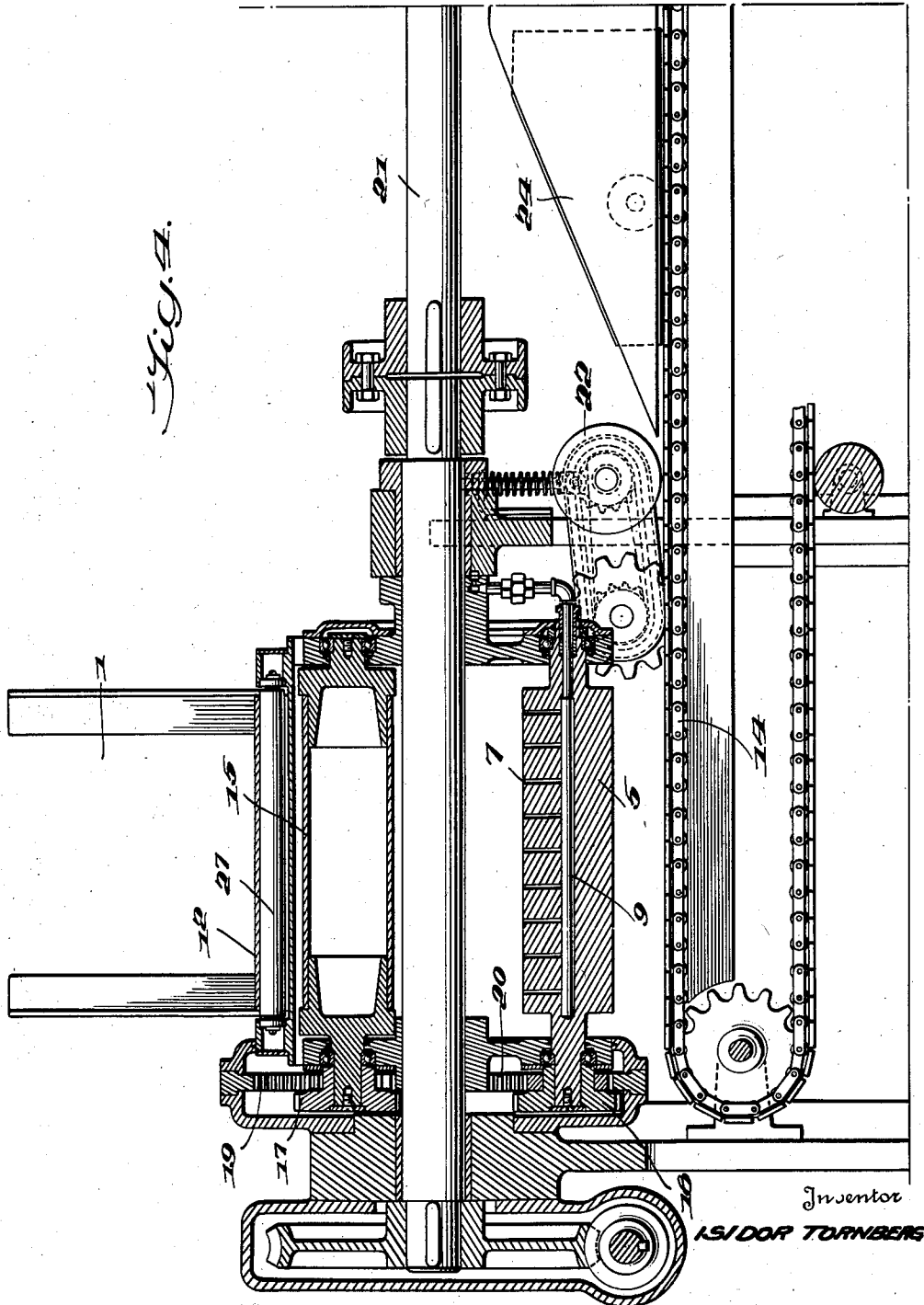
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ROTARY STUFFING MACHINE

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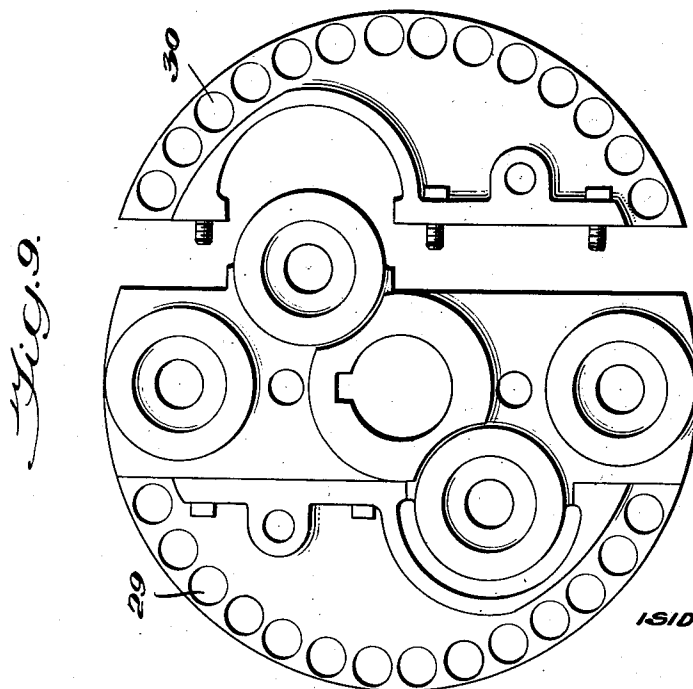
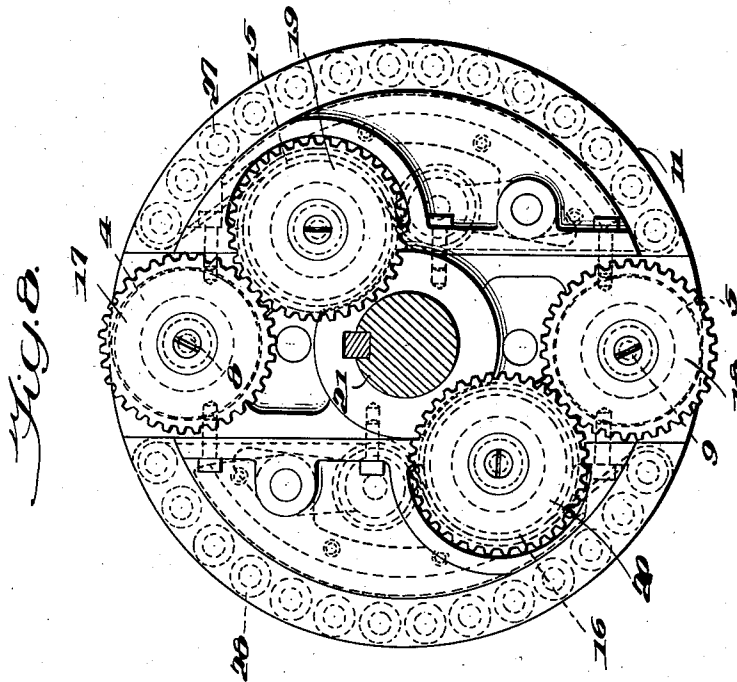
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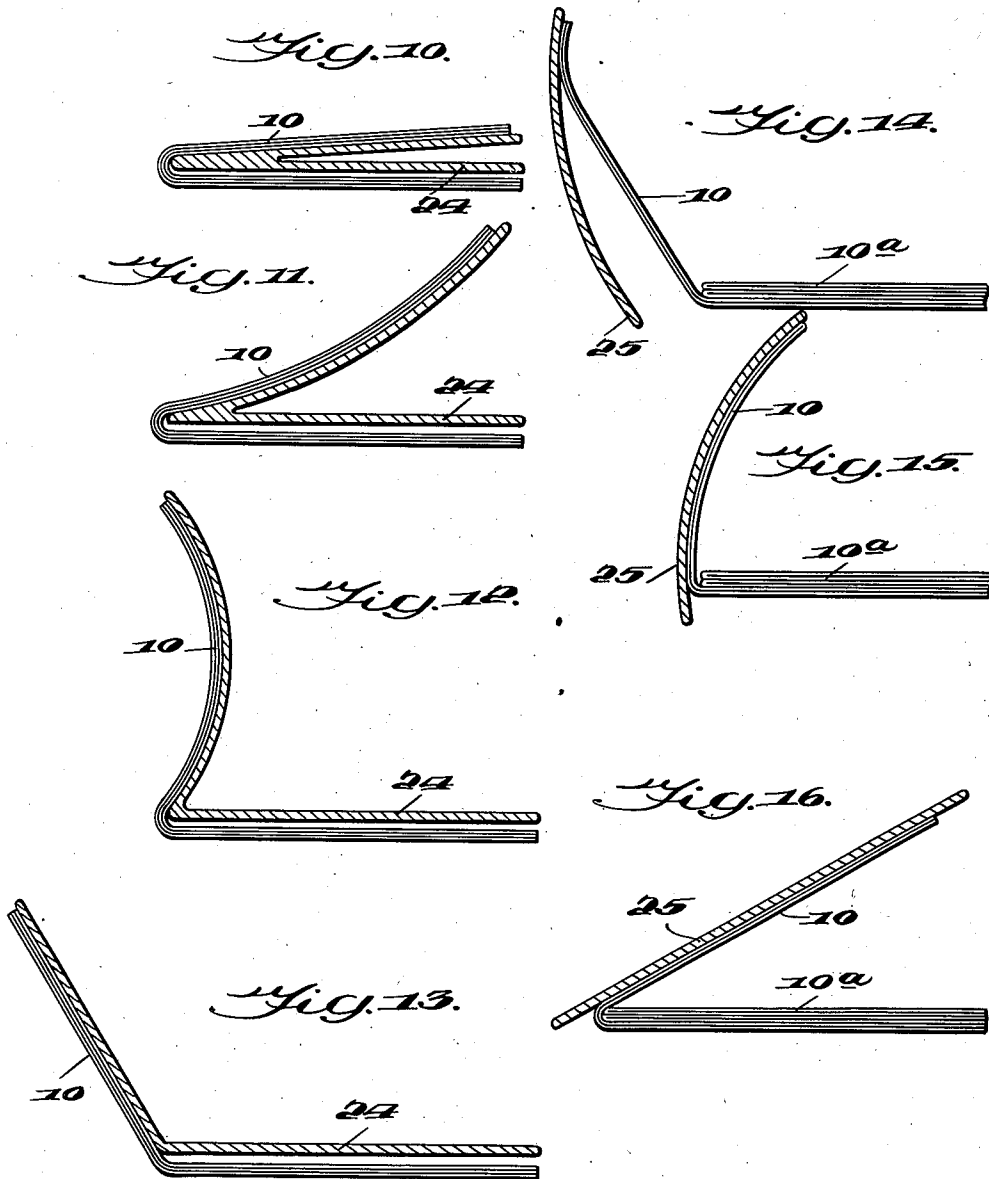
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ROTARY STUFFING MACHINE

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,279,269

ROTARY STUFFING MACHINE

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Application February 15, 1940, Serial No. 319,177

23 Claims. (Cl. 270—57)

This invention relates to improvements in rotary stuffing machines, that is, a machine wherein one section of a newspaper or the like is inserted into another section and the two sections then inserted into a third section and so on, according to the number of units or sections which may complete the entire issue of the newspaper:

The modern trend, particularly in Sunday newspapers, calls for a number of different sections, the main or primary news section and other sections, some printed in black, others in color, including rotogravure sections, book sections and other special sections.

The practice generally followed is to print the various sections ahead of the date of issue which they bear, and in fact many of these sections are printed a week or more in advance, some of them during the preceding week and the latest current news or main section on Saturday night or early Sunday morning.

To assemble all of these different sections into one is quite an arduous and time-consuming task.

At the present time the usual practice is to stuff or insert one section into the other and so on by hand or manually.

In some of the larger newspaper offices machines are employed which do this work of stuffing or inserting the sections into each other automatically. In general, however, this is not satisfactory and is a very slow operation due in part to the large number of reciprocating parts and complicated mechanism required.

The object and purpose of the present invention is to so construct a rotary stuffing machine, wherein the transfer of each section to the finally assembled product is accomplished by means of a rotary cylinder which strips or peels off one section from its respective pile in a rotary movement and said section is then carried to a device wherein said section is opened and the section from the next unit inserted therein and so on, according to the number of sections or units for such sections and after all sections have been inserted then to a closing device and then conveyed away from the machine.

It is quite important that the lower section being removed from the hopper or unit containing, such sections be removed therefrom in or by a rotary movement, that is peeled therefrom, particularly in view of the fact that the papers, due in some instances to the printing of the products on rotogravure presses will not permit of a sliding movement of one section

against the other in the removal of the lowermost section due to the sticky or adhesive nature of the ink used in the printing of the papers.

The present invention also includes vacuum or suction means for peeling off each section and vacuum or suction means for opening up a section, so that subsequent sections may be inserted therein.

A further object is to provide a cam shaped guide or closing device for closing the section after the assembly has been completed, that is, after all sections have been properly inserted in the preceding section or sections.

Referring to the drawings wherein similar numerals of reference are used to indicate corresponding parts in each of the several views:

Fig. 1 is a side elevation of the left hand portion of the machine, disclosing the hopper or guide for containing the main or current news sections and one unit containing the first bunch of sections to be inserted in said main section;

Fig. 2 is a side elevation of the other end of the machine disclosing the hopper or guide containing the sections last to be inserted and the closing device;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the regular line 4—4 of Fig. 3;

Fig. 5 is a detail view showing the vacuum wheel lifting a corner of a section;

Fig. 6 is a detail view partly in section of the vacuum wheel;

Fig. 7 is a sectional view on line 7—7 of Fig. 6;

Fig. 8 is an end view partly in section of the rotary removing device;

Fig. 9 is a detailed view in side elevation of the housing for the belt carrying rolls;

Fig. 10 is a sectional view through the opener on the line 10—10 of Fig. 1;

Fig. 11 is a sectional view through the opener on the line 11—11 of Fig. 1;

Fig. 12 is a sectional view through the opener on line 12—12 of Fig. 1;

Fig. 13 is a sectional view through the opener on the line 13—13 in Fig. 1;

Fig. 14 is a sectional view through the closing device on line 14—14 of Fig. 2;

Fig. 15 is a section through the closing device on line 15—15 of Fig. 2; and

Fig. 16 is a section through the closing device on line 16—16 of Fig. 2.

The current news sections are stacked in the hopper 1 and the sections to be inserted therein stacked in the hoppers 2 and 3. Vacuum or suction cylinders 4 and 5 are provided, the suction

being through the openings 6 and 7 leading into the openings 8 and 9 respectively which are connected to a suction apparatus. The bottom section 10 of the stack of sections is rolled off of the sections above it by means of vacuum cylinder 4. This section it will be readily seen is rolled off the bottom of the pile without any sliding motion between the sections. The vacuum cylinders 4 and 5 rotate in an opposite direction to the periphery of the main cylinder 11 and at the same surface speed. Belts 12 and 13 support the stack of sections while the vacuum cylinder 4 carries the lower section and delivers it to the conveyor 14 and the vacuum cylinder 5 arrives in position to remove the next lower section from the stack.

The belts 12 and 13 also run in a direction opposite to that of the periphery of the cylinder 11 and at an equal speed. There is therefore no relative movement between these belts 12 and 13 and the stack of paper sections.

The belts 12 and 13 are driven by pulleys 15 and 16, which pulleys are in turn driven by the vacuum cylinders through gears 17 and 18. The vacuum cylinders are driven through fixed integral gear rings 19 and 20.

These belts 12 and 13 it will be seen, pass beneath and support opposite sides of the lower section in the hopper and thereby support the stack during the intervals of time between vacuum cylinder operation, that is, between the time when one section has been removed by cylinder 4 and the cylinder 5 reaches its operative position beneath the stack for removing the then lowermost section.

The cylinder 11 rotating with the shaft 21 and the lower section 10 of the stack having been rotatively removed from the bottom of the stack is held fast on the vacuum cylinder 4 until said cylinder 4 reaches a position at the bottom of the cylinder in a position corresponding to that occupied by vacuum cylinder 5, as shown in Fig. 3, whereupon the vacuum holding the section 10 to the vacuum cylinder 4 is released and the section 10 deposited on the conveyor 14. This conveyor is constantly running in a direction in line with the axis of the cylinder 11.

The section 10 is then carried by the conveyor 14 in a flat condition beneath a vacuum or suction wheel 22, which vacuum wheel by suction lifts or opens up the section 10 at the corner 23 opposite the fold on the leading edge of the section, the section 10 constantly moving forward or along with the conveyor. This section with its corner 23 lifted then encounters a plow shaped former or guide 24 by which the section 10 is further opened and is carried in this opened condition beneath the next unit 11 which feeds the first section to be inserted to the conveyor in a manner similar to that previously described as to the removal of the sections from hopper 1. Instead, however, of the bottom section of the sections contained in hopper 2 being fed to the conveyor said section is dropped between the opened portion of section 10 and the remainder of said section. Section 10 at this time has reached a position below the cylinder removing sections from hopper 2.

If further sections from other units are to be inserted the section 10 with the section from hopper 2 inserted therein is carried forward by the conveyor beneath another vacuum or suction wheel 22, which, as previously, lifts a portion of the outer section 10 and the section with the insert is carried to another opener or guide 24 and

held in open position until a section from the next unit is in a similar manner delivered between the open portions of the section.

When there are no further sections to be inserted the section 10 with its insert or inserts is then carried forward by the conveyor to a closing former or guide 25 through means of which the lifted portion of section 10 is closed or folded down upon the inserted sections.

A vacuum or suction wheel 22 of a similar construction is utilized in connection with each unit as in the first unit and a similar guide or opener is used following each unit. But one closing former or guide is used after the last unit.

The mechanism shown in section in Fig. 3 for rotatively removing the lower section from the stack of sections in its respective hopper is identical in each of the several units and operates in the same manner.

The closing former or guide 25 is so shaped that the lifted portion of section 10 contacts with the side of the closing former 25, in the open condition of the section, as shown for example, in Figs. 14, 15 and 16. The continued movement of the section 10 with its inserted section 10a along the closing former 25 gradually causes the lifted portion of section 10 to be folded down upon the inserted section 10a. The completed assembly of the several sections is then conveyed away from the machine for delivery.

As stated above, the several vacuum or suction cylinders 22 are substantially identical in structure and operation, and as many as need be may be provided.

After the various sections, or as many as are desired to be inserted in the outside section have been acted upon, the outer section or open portion of the first section is closed by a former 25, which is located in a substantially reverse position to that in which the opening former 24 is located.

The inserted sections, of course, are not opened or acted upon by the formers but only the main or current news section which is taken from the hopper 1.

After all of the sections have been inserted and the open portion of section 10 closed, the assembly of the various sections is delivered on to a belt or conveyor 26 for delivery to any desired station.

The belts 12 and 13 are endless belts which travel over a series of rollers 27 and 28, the rollers being journaled in a series of openings 29 and 30 of the housing or casing shown in Fig. 9.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, a cylinder rotative on its own axis for peeling a section of newspaper from the stack in the first hopper, a rotating cylinder, said rotative cylinder mounted in said rotating cylinder and movable in an arcuate path around the axis of said rotating cylinder, a conveyor, said rotative cylinder retaining and delivering said section to the conveyor, suction means in the path of the conveyor for opening said section as it is carried along by the conveyor to receive an insert of another section of the newspaper, and means for delivering said latter section into the opened section.

2. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotative cylinder for peeling the lowermost sec-

tion of newspaper from the first stack, a conveyor, a rotating cylinder, said rotative cylinder being mounted in said rotating cylinder and movable in an arcuate path around the axis of said rotating cylinder, said rotative cylinder retaining and delivering said section to the conveyor, means in the path of movement of the conveyor for opening said section to receive an insert of another section of newspaper from the next stack in the series, means for delivering said latter section into the opened section, and means in the path of movement of the conveyor for closing said first section on said inserted section.

3. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotative cylinder for peeling the lowermost section of newspaper from the first stack, a conveyor, a rotating cylinder, said rotative cylinder mounted in said rotating cylinder and movable in an arcuate path around the axis of said rotating cylinder and retaining and delivering said section to the conveyor, suction means in the path of movement of the conveyor for opening said section as it is carried along by the conveyor to receive an insert of another section of newspaper from the next stack in the series, means for delivering the latter section into the opened section, and means for closing said first section on said inserted section.

4. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotative cylinder for peeling the lowermost section of newspaper from the first stack, a conveyor, a rotating cylinder, said rotative cylinder being mounted in said rotating cylinder and movable in an arcuate path around the axis of said rotating cylinder and retaining and delivering said section to the conveyor, means in the path of movement of the conveyor for opening said section to receive an insert of another section of newspaper from the next stack in the series, means for removing the section to be inserted from a second stack, said means retaining and delivering said last mentioned section into position in the first section, and means for closing said first main section on the inserted section.

5. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotative cylinder for peeling a section of newspaper from the first stack, a conveyor, a rotating cylinder, said rotative cylinder being mounted in said rotating cylinder and movable in an arcuate path around the axis of said rotating cylinder, and retaining and delivering said section to the conveyor, means in the path of movement of the conveyor for opening said section to receive an insert from another section of the newspaper from the second stack, means for inserting the latter section into the opened section, and means for closing said first section on the inserted section.

6. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotative cylinder for peeling a section of newspaper from the first stack, a conveyor, a rotating cylinder, said rotative cylinder movable in an arcuate path around the axis of said rotating cylinder and delivering said section to the conveyor, means for opening said section to receive an insert of another section of the newspaper from the second stack, means for peeling a section of newspaper from the second stack, said latter means retaining and delivering the sec-

tion to be inserted into the first section, and means for closing the first section on said inserted section.

7. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, a rotating cylinder, rotating suction cylinders mounted at opposite points in said cylinder for peeling and consecutively removing a section of newspaper from the first stack, said suction cylinders rotatable in an arcuate path around the axis of said rotating cylinder, a conveyor, one of said suction cylinders when it removes the section from the stack retaining same and delivering the section to the conveyor when the other suction cylinder arrives beneath the stack and in position for removing a section from said stack, means for opening the section as it is being carried forward by the conveyor, and means for delivering a section from a second stack into the opened section.

8. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, a rotating cylinder, rotating suction cylinders mounted at opposite points in said cylinder for rotatively and consecutively peeling a section of newspaper from the first stack, said suction cylinders rotatable in an arcuate path around the axis of said rotating cylinder, a conveyor, one of said suction cylinders when it removes the section from the stack retaining same and delivering the section to the conveyor when the other suction cylinder arrives beneath the stack and in position for peeling a section from said stack, means in the path of movement of the conveyor for opening the section as it is being carried forward by the conveyor, means for delivering a section from a second stack into the opened section, and means for closing said open section on the inserted section.

9. In a stuffing machine provided with a series of hoppers containing stacks of newspapers, a rotating cylinder having a series of rolls around and within its periphery, pulleys mounted in said cylinder, a plurality of endless belts traveling over said rolls and on said pulleys, a conveyor, means for peeling a section of newspaper from the first stack and retaining said section until delivery to the conveyor, said means traveling in an arcuate path around the axis of said rotating cylinder, means for opening said section as it is carried forward by the conveyor, and means for removing a section from a second stack and inserting same in said opened section.

10. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, a rotating cylinder having a series of rolls around and within its periphery, pulleys mounted in said cylinder, a plurality of endless belts traveling over said rolls and on said pulleys, a conveyor, means for peeling a section of newspaper from the first stack and retaining said section until delivery to the conveyor, said means traveling in an arcuate path around the axis of said rotating cylinder, means for opening said section as it is carried forward by the conveyor, means for removing a section from a second stack and inserting same in said opened section, and means for closing said first section on said inserted section.

11. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, means for peeling a section of newspaper from the first stack, a conveyor, said means retaining and delivering said section to the conveyor, a rotating cylinder in which said means is mounted

and around the axis of which it travels in an arcuate path, means for supporting the stack after the lower section has been removed therefrom and while it is being carried to the conveyor and until the first mentioned means returns to its original position below the stack for removing another section, means for opening said first-mentioned section as it is being carried forward by the conveyor to receive an insert of another section of newspaper from a second stack, and means for delivering said second section into the opened section.

12. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, means for rotatively removing a section of newspaper from the first stack, a conveyor, said means retaining and delivering said section to the conveyor, a rotating cylinder in which said means is mounted and around the axis of which it travels in an arcuate path, means for supporting the stack after the lower section has been removed therefrom and while it is being carried to the conveyor and until the first mentioned means returns to its original position below the stack for removing another section, means for opening said first-mentioned section as it is being carried forward by the conveyor to receive an insert of another section of newspaper from a second stack, means for delivering said second section into the opened section, and means for closing the opened section on the insert.

13. In a stuffing machine, provided with a series of hoppers containing stacks of newspapers, a rotating cylinder, rotating suction cylinders mounted at opposite points in said cylinder for rotatively and consecutively peeling a section of newspaper from a stack, a conveyor, said suction cylinders traveling in an arcuate path around the axis of said rotating cylinder, said suction cylinder when it removes the section from the stack retaining same and delivering the section to the conveyor at or about the time the other suction cylinder arrives beneath the stack and in position for removing another section from said stack, a series of rolls mounted around and within the periphery of the rotating cylinder, pulleys mounted in said cylinder, a plurality of endless belts traveling over said rolls and on said pulleys and supporting the stack in position during transfer of a section by one suction cylinder to the conveyor, and until the other suction cylinder is in position beneath the stack for removal of the next section, means for opening said section delivered to the conveyor to receive an insert of another section of the newspaper from a second stack, means for rotatively removing a section of newspaper from the second stack, said means retaining and delivering the section to the conveyor being inserted into the first section, and means for closing the first section on said inserted section.

14. In a stuffing machine provided with a series of hoppers for holding stacks of newspapers, means contacting the lower section of newspaper in the first stack, said means being rotative and in the rotative movement thereof peeling said lower section from the stack, a rotating cylinder, a conveyor, said rotative means mounted in said rotating cylinder and moving in an arcuate path around the axis of said rotating cylinder, and provided with means for retaining and delivering said removed section to the conveyor for carrying the removed section beneath the next stack in the series.

15. In a stuffing machine provided with a se-

ries of hoppers for holding stacks of newspapers, means contacting the lower section of newspaper in the first stack, said means being rotative and in the rotative movement thereof peeling said lower section from the stack, a rotating cylinder, a conveyor, said means traveling in an arcuate path around the axis of said rotating cylinder and provided with means for retaining and delivering said removed section to the conveyor for carrying the removed section beneath the next stack in the series, means for peeling the lower section from the next stack in the series, means in the path of movement of the conveyor for opening the first removed section so as to receive the insert removed from the next stack in the series.

16. In a machine for removing newspapers from a stack, a rotating cylinder, rotating suction cylinders mounted at opposite points in said cylinder for rotatively and consecutively peeling a section of newspaper from the stack, a conveyor, one of said suction cylinders when it peels the section from the stack retaining same and delivering the section to the conveyor when the other suction cylinder arrives beneath the stack and in a position for peeling the next section from said stack.

17. In a stuffing machine provided with a series of hoppers for receiving stacks of newspapers, means contacting the lowermost section of papers in the first stack, said means being rotative on its own axis and in the rotative movement thereof, peeling said lower section from the stack, a conveyor, a rotating cylinder, said means traveling in an arcuate path about the axis of said rotating cylinder and delivering the section of newspaper to the conveyor for conveying said removed section to the next stack in series, means in the path of movement of the conveyor for opening said removed section to receive an insert of the lowermost section of newspapers in the next stack in the series, and means for peeling the lowermost section from the second stack and delivering it into the opened section.

18. In a stuffing machine provided with a series of hoppers and containing stacks of newspapers, rotative means contacting the lowermost section in the first stack for peeling said section of newspaper from the stack, a conveyor for conveying said section to the next stack in the series, a rotating cylinder, said means movable in an arcuate path around the axis of said rotating cylinder, and retaining said section until it is delivered to the conveyor, means in the path of movement of the conveyor for opening said section to receive an insert of the lowermost section of newspaper in the next stack in the series, and means for delivering said second section into the opened section.

19. In a machine for removing newspapers from a stack, a rotating cylinder, a rotating suction cylinder for rotatably peeling a section of newspaper from the stack, a conveyor, said suction cylinder traveling in an arcuate path around the axis of the rotating cylinder and retaining the section of newspaper peeled from the stack until it is delivered to the conveyor, means for opening the section as it is being carried forward by the conveyor, and means for delivering a section from a second stack into the opened section.

20. In a machine for removing newspapers from a stack, a rotating cylinder, a rotating suction cylinder thereon for rotatively peeling a sec-

tion of newspaper from the stack, a conveyor, said suction cylinder retaining the section of newspaper peeled from the stack until it is delivered to the conveyor.

21. In a machine for removing newspapers from a stack, a rotating cylinder, a rotating suction cylinder for rotatively peeling a section of newspaper from the stack, a conveyor, said suction cylinder traveling in an arcuate path around the axis of the rotating cylinder and retaining the section of newspaper peeled from the stack until it is delivered to the conveyor.

22. In a machine for removing newspapers from a stack, a rotating cylinder, a rotating suction cylinder mounted in said rotating cylinder for rotatively peeling a section of newspaper from the stack, a conveyor, said rotating suction cylinder retaining the section of newspaper

peeled from the stack and traveling in an arcuate path about the axis of the first-mentioned rotating cylinder until the section of paper is delivered to the conveyor.

23. In a machine for removing newspapers from a stack, a rotating cylinder, suction cylinders mounted at opposite points in said cylinder for rotatively and consecutively peeling a section of newspaper from the stack, a conveyor, each of said suction cylinders when it peels the section from the stack retaining same and traveling in an arcuate path about the axis of the first-mentioned rotating cylinder, and retaining same and delivering the section to the conveyor when the other suction cylinder arrives beneath the stack and in a position for peeling the next section from said stack.

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