

**April 28, 1953**

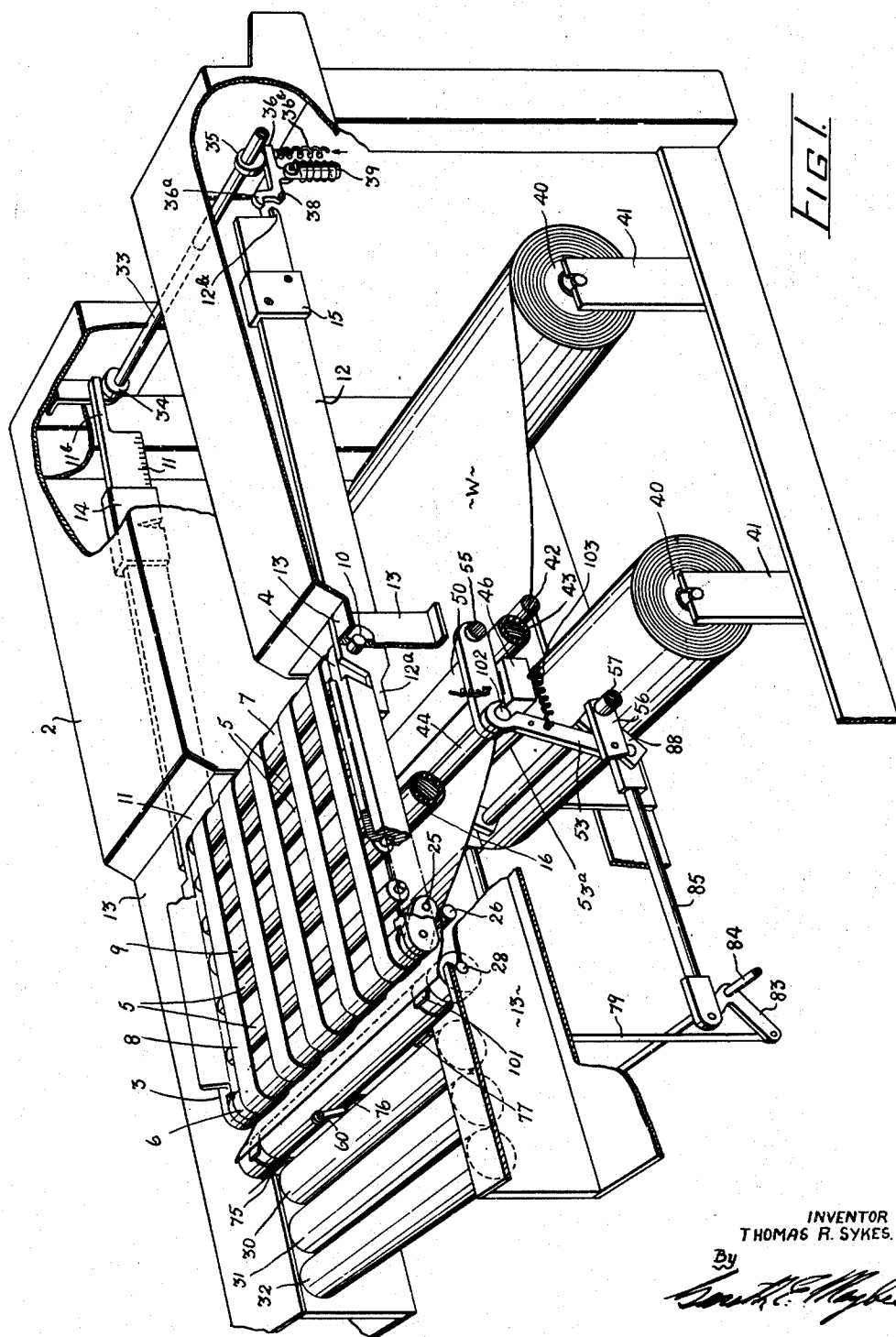
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**2,636,654**

### CONVEYER CONTROL TABLE

Filed June 3, 1949

5 Sheets-Sheet 1



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CONVEYER CONTROL TABLE

2,636,654

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5 Sheets-Sheet 2

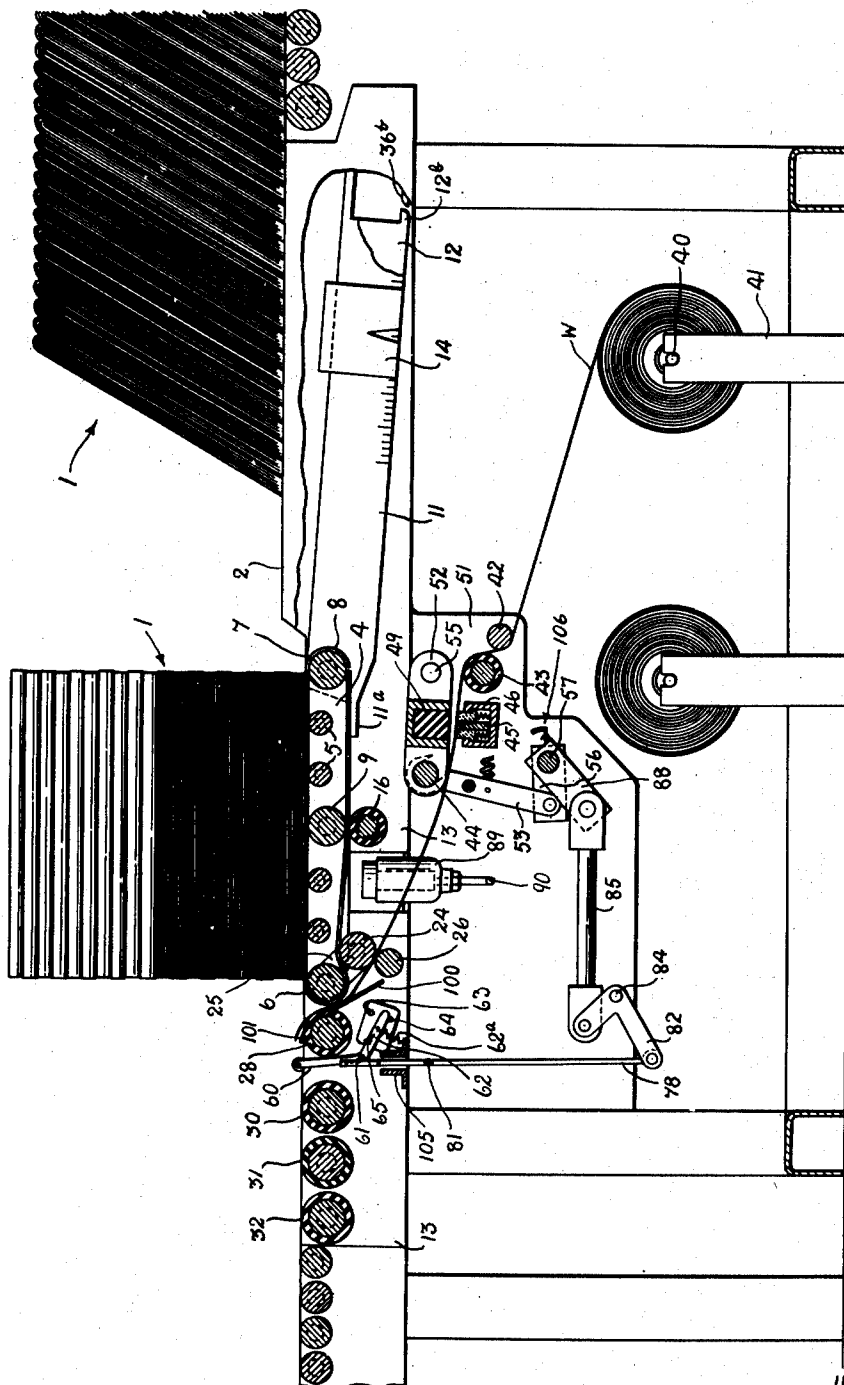


FIG. 2

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5 Sheets-Sheet 3

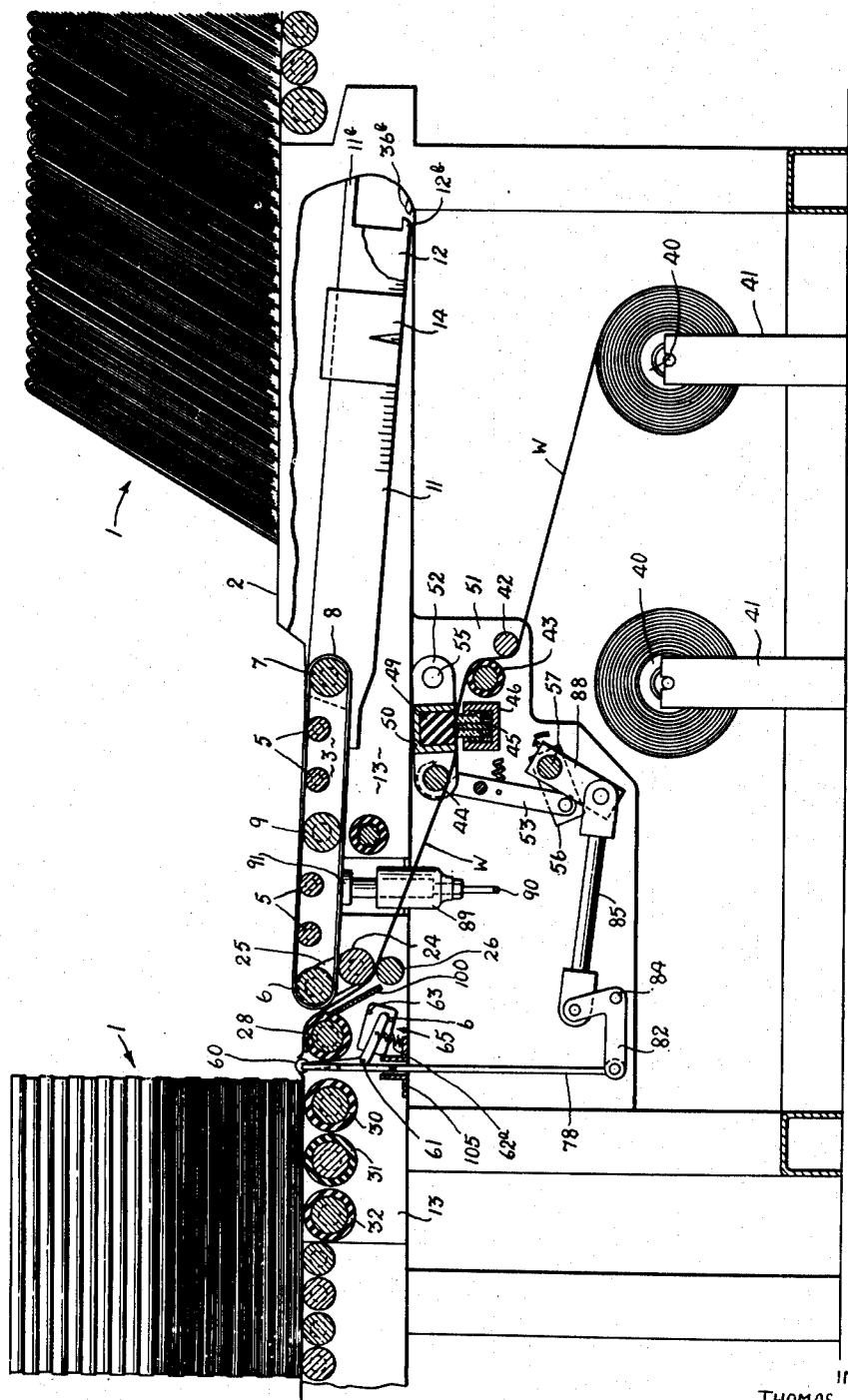


FIG. 3

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5 Sheets-Sheet 4

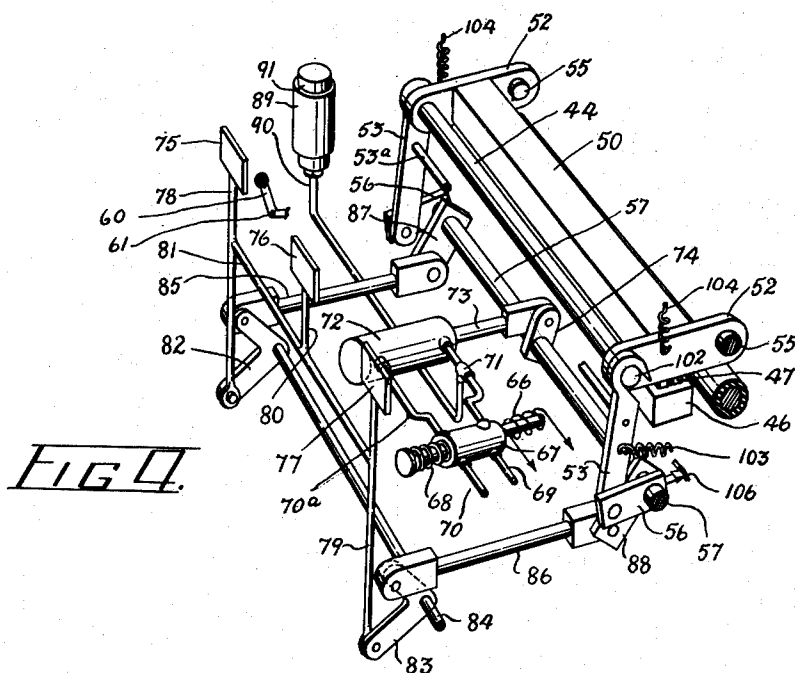


FIG. 4.

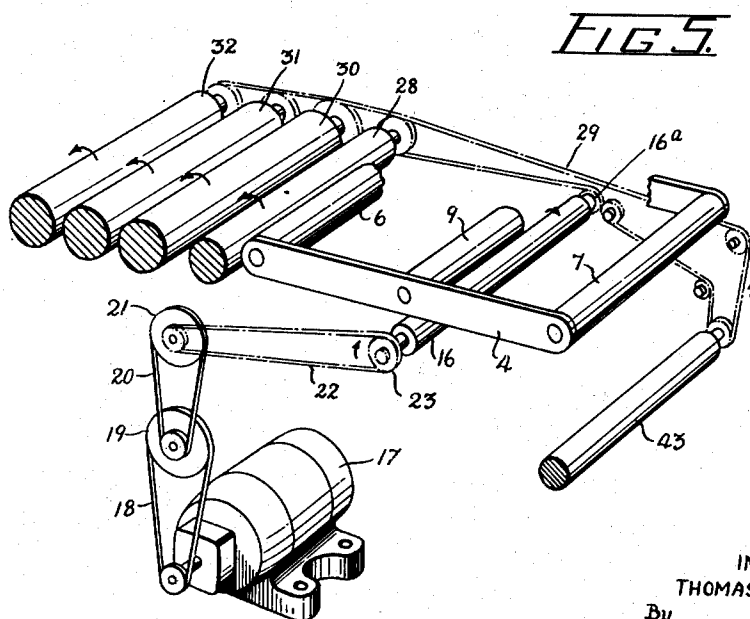


FIG. 5.

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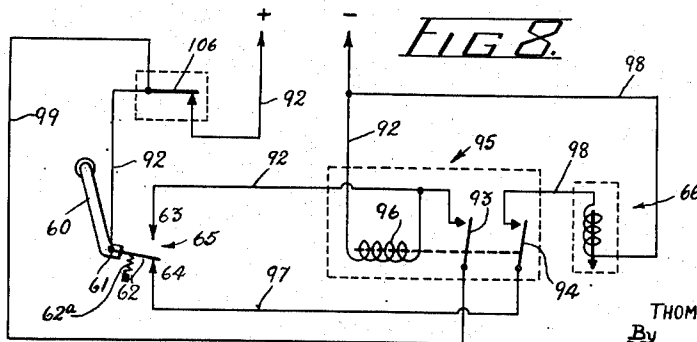
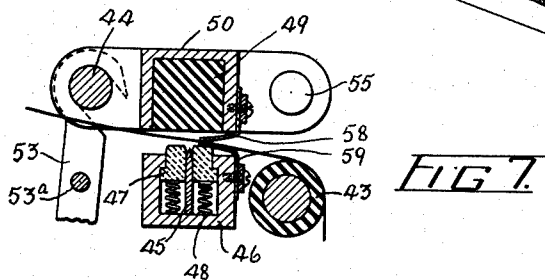
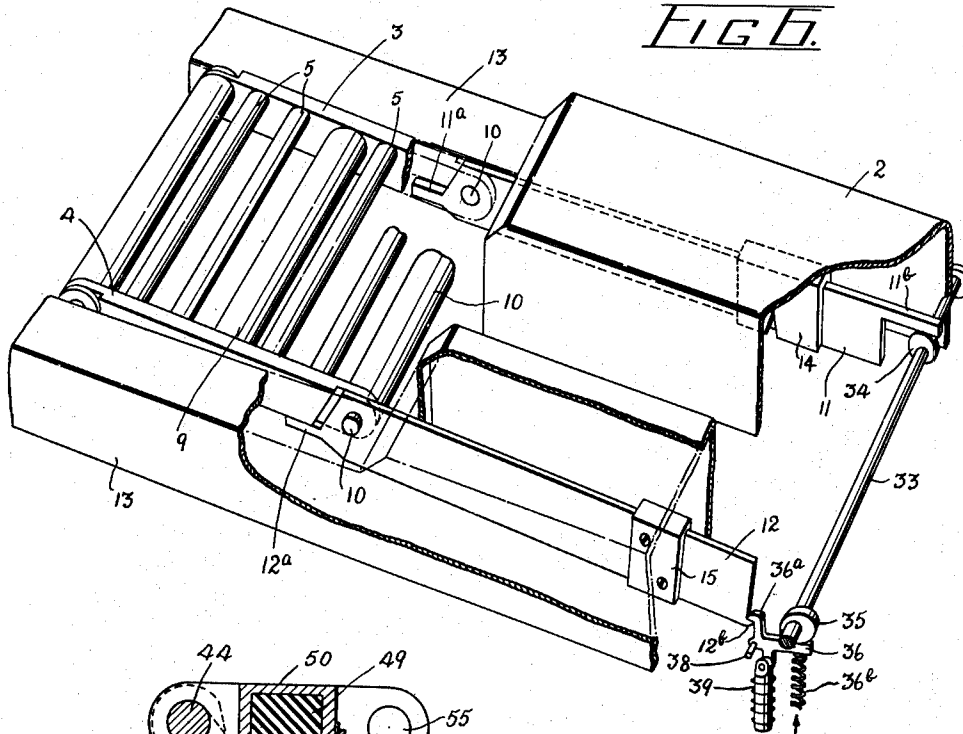
April 28, 1953

T. R. SYKES  
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2,636,654

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5 Sheets-Sheet 5



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## UNITED STATES PATENT OFFICE

2,636,654

## CONVEYER CONTROL TABLE

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Application June 3, 1949, Serial No. 96,955

6 Claims. (Cl. 226-19)

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This invention relates to a conveyor control table particularly for use in mailing rooms of newspapers and the like.

The purpose of this invention is to facilitate the handling of papers in the mailing room of a newspaper plant.

According to the common practice the newspapers which have been printed and folded are carried to the mailing room on a wire belt conveyor. The papers on this conveyor are somewhat overlapped with every 25th or 50th paper displaced so that the number of papers can be readily counted. These papers are gathered into lots (commonly called lifts) of 25 or 50 papers and two or more lifts are placed, one on the other in a stack, with their folded edges alternated on a table or on a belt conveyor.

The invention facilitates the gathering of the papers into lifts, eliminates the manual operation of pushing the pile of papers along the conveyor belt or table and simplifies the operation of placing the bundle on a bottom wrapper.

According to this invention one or more lifts of paper are placed on a control table which is provided with a conveyor to carry the stack off the table when a predetermined number of lifts has been placed on the table. Means is also provided to cut and feed a predetermined length of wrapping material beneath the stack. Means is provided for normal automatic actuation of the conveyor-table and also for semi-automatic actuation when desired.

The invention is hereinafter more particularly described and is illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a perspective view of the control table broken away in a number of places to illustrate the construction and operation of the device;

Fig. 2 is a diagrammatic longitudinal section also partly broken away showing the control table in operative position ready to carry a stack of papers to a conveyor;

Fig. 3 is a view similar to Fig. 2 showing the control table in the position it adopts after the stack has been carried off the control table; with the wrapping material underneath it and ready to receive another stack of papers;

Fig. 4 is a diagrammatic perspective view of the means of perforating the wrapping material;

Fig. 5 is a diagrammatic perspective view showing the drive means for apparatus;

Fig. 6 is a perspective view of the control table semi-automatic actuating position;

Fig. 7 is an enlarged cross-section through the perforating mechanism; and

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Fig. 8 is a wiring diagram.

Printed and folded newspapers 1 are fed by the usual means onto a slotted receiving table 2 with every 25th or 50th paper (or other predetermined number) displaced so that the operator can readily divide the papers into lifts of a predetermined number. Assuming that it is desired to provide a bundle of 50 papers the operator will pick up 25 papers and place them on the control table with the folded edges at one side of the control table and another 25 papers with the folded edges at the other side of the control table.

#### Construction of control table.

The control table consists of opposite side frame members 3 and 4 between which extend a plurality of rollers having spindles journaled in the side members 3 and 4. As shown in Figs. 1, 2 and 3 there are four small supporting rollers 5 and end rollers 6 and 7 around which extend endless belts 8, the supporting rollers 5 and the endless belts providing a conveyor support for the papers which are placed thereon.

Intermediate the ends of the table is a roller 9 also journaled in the frame members 3 and 4, this roller 9 being adapted to be rotated in a manner hereafter described to cause the belts to turn around the rollers 6 and 7 to carry away the papers which have been placed on the table.

Side frame members 3 and 4 are pivotally mounted by means of shaft 10 which is journaled in frame members 13 at each side of the table. Journaled on shaft 10 are beams 11 and 12 which may therefore be pivoted relative to the table. Beam 11 has an adjustable weight 14 thereon and the beam may be calibrated so that the weight can be adjusted to achieve the desired balancing effect. Beam 12 has a fixed weight 15 thereon, and these weights combined are sufficient to counter-balance the weight of the control table and a predetermined number of lifts supported thereon.

Projections 11a and 12a extend from the forward end of the beams beneath the frame members 3 and 4 of the table and support the table and prevent pivoting of the table relative to the beams in a downward direction, while permitting the table to be pivoted upwardly out of engagement with the extension-supports 11a and 12a. It will be seen from the above description that when a predetermined number of papers are placed on the control table the table will pivot downwardly on shaft 10 lifting the beams 11 and 12 and their weights 14 and 15.

### Automatic operation of the control table

When the table pivots downwardly the belts 8 on the control table will be pinched between control table roller 9 and the friction surface of driven roller 16. The table is shown in its "up" position in Fig. 3 and its "down" or "driven" position in Fig. 2. The driven roller 16 may be driven in a suitable manner. Shown diagrammatically in Fig. 5 is a motor 17 which drives a belt 18 to gear reduction pulley 19 which in turn drives the chain 20 to sprocket 21 which drives a chain 22 to a sprocket 23 on the shaft of the roller 16. The drive means is eliminated from the other views for the sake of clarity.

As soon as the table drops, the belts 8 will be rotated around rollers 6 and 7 as described above. An idler roller 24 shown particularly in Figs. 2 and 3 is journaled on links 25, 25 pivotally mounted on control table frame members 3 and 4. Another idler roller 26 is journaled on frame members 13 and when the table drops the roller 24 is pressed upwardly by roller 26 to engage the underside of the belts 8 and said belts rotate the roller 24 to feed the sheet or web of wrapping paper W, which is pounded between said rollers, upwardly past the front end of the control table and over the driven roller 28 which preferably has a friction surface.

Roller 28 is driven by chain 29 as shown in Fig. 5 by means of a sprocket 30a on roller 16. Therefore roller 28 is continuously rotating but since the end of the paper W merely rests on it there is not sufficient friction to feed the web of wrapping paper W until roller 24 is caused to rotate by the dropping of the control table, so that paper is fed only when the conveyor portion of the control table is in operation carrying the pile of papers from right to left in the drawings towards feeding rollers 30, 31 and 32 which are also driven by chain 29 as shown in Fig. 5. The paper as it passes off the control table presses the wrapping paper W against rollers 28, 30, 31 and 32 so that the wrapping paper is carried along underneath the stack of newspapers as illustrated in Fig. 3. In fact the friction between the lift of papers and the rollers is sufficient to carry the web of wrapping paper W beneath the lift of newspapers and the chief purpose of roller 24 is to keep the web out of contact with roller 6, which would tend to push the web back. Rollers 30, 31 and 32 are not necessarily driven rollers since the momentum of the lift of papers would carry it over idler rollers. These rollers are the first stage of a receiving table or conveyor on which the stack of papers may be tied and from which it may be delivered to a truck or other means for distributing the papers to the consumers.

### Semi-automatic operation

It will be observed that the starting of the conveyors on the control table is automatic, as described above, the mechanism operating as soon as enough papers have been placed on the control table to cause it to drop. However, for some purposes it is desirable to operate the device manually or rather semi-automatically, particularly when stacks of paper containing different numbers are required and for this purpose means is provided for preventing the automatic actuation of the control table. This means is shown chiefly in Figs. 1 and 6 but partly also in Figs. 2 and 3.

Rotatably mounted in the fixed frame of the machine at the rear of the beams 11 and 12 is a

shaft 33 having secured thereto at one end a cam member 34 and at the other end a cam member 35. The beam 11 has a rearwardly projecting portion 11b adapted to be engaged by the cam 34 when the shaft 33 is rotated by the operator by a handle or other suitable means. In Fig. 1 the cam 34 is shown out of engagement with the projection 11b and in Fig. 6 is shown in engagement with the projection 11b, thus tilting the arm 11 upwardly so that the projection 11a at the other end of the arm is out of engagement with the table frame member 3 and provides no support for the table. When the table is not supported by the beam 11, it is supported only by the beam 12 and weight 15, which is just sufficient to hold the table in its "up" position, but the placing of a small number of papers on the table will cause it to drop. To prevent it from dropping a latch 36 is pivotally mounted on a pin 38 which is secured to the machine frame. This latch 36 has a hook 36a adapted to engage a projection 12b on the beam 12. When the device is in normal fully automatic actuating position the latch 36 is held out of beam engaging position by means of the cam 35 as shown in Fig. 1, but when the device is in manual or semi-automatic operating position by virtue of rotation of the shaft 33, the cam 35 disengages the latch and compression spring 36b forces the tail of the latch up so that hook 36a is in engaging position as shown in Fig. 6. When the control table rises to "up" position, the curved end of the projection 12b will engage the curved nose of the hook 36a and the catch will be pushed back and then will snap over the end of the projection 12b as shown in Fig. 6, thus holding it in "up" position so that when papers are put on the table, the table will stay in "up" position and will not drop to the position at which the table conveyor is operated.

When the operator of the device has placed the desired number of papers on the control table, by actuating a suitable switch, not shown, a solenoid 39 shown diagrammatically in Figs. 1 and 6 will be actuated to pivot the catch against the pressure of spring 36b causing hook 36a to move out of engagement with the projection 12b, so that the catch no longer restrains the beam 12 from pivoting and the beam will therefore swing up permitting the control table to drop into operating position so that the papers are carried off the control table in the manner hereinbefore described. Details of the means for operating the shaft 33, details of the solenoid 39, and details of the electrical circuit are omitted as they do not form part of the invention and may be of any suitable construction.

### Wrapping material feeding and perforating means

As hereinbefore described a sheet or web of wrapping material such as kraft paper is fed to and under the stack of newspapers. The wrapping material is wound around a spindle 40 suitably journaled on brackets 41 mounted on a machine frame member. As shown in Figs. 2 and 3 a supplementary roll of material is provided for use when a roll is being removed and inserted in the machine, but this need not be specifically described. The web of wrapping material W passes under an idler roller 42, over a driven roller 43, under an idler roller 44 and over rolls 26 and 28 as hereinbefore described. Roller 43 is driven as shown in Fig. 5 by the chain 29 which also drives the conveyor rollers at the

same speed. Driven roller 43 is not primarily the feeding means for the web. The prime mover of the web is the pull exerted thereon when its free end is clamped beneath a moving stack of newspapers as previously described. Roller 43 is an assisting roller which operates continuously but does not feed the web W unless and until it is under tension. Therefore when the web is held immediately for perforating as hereafter described, roller 43 is ineffective. However, when the web is being pulled by the stack of papers and therefore under some tension, the web will engage roller 43 which will assist in feeding it from the spindle 40. A guide plate 100 extends between frame members 13 to direct the web from roller 26 to roller 28. Roller 28 is provided as shown in Fig. 1, with circumferential grooves to receive spring stripping fingers 101 which serve to prevent the forward edge of the web from passing around roller 28.

The web of paper W passes through a perforating member having a perforating blade 45 mounted in a channel member 46 between cheeks 47 spring pressed upwardly by springs 48 in the bottom of the channel on each side of the blade. These cheeks permit the paper to normally pass over the blade until the anvil 49 which is mounted in the channel member 50 is pressed down on the cheeks causing the blade to press the paper against the anvil 49, which may be made of rubber or similar resilient material, and thus perforate the wrapping paper W.

The channel 46 in which the perforating blade is mounted is supported at opposite ends on laterally adjustable apron member 51 shown in Figs. 2 and 3. On the other hand the anvil channel member 50 is mounted on links 52, 52 which are pivoted at one end to the apron member 51 by means of stub shafts 55, 55. Between the free ends of pivoted link members 52 is journaled roller 44, and pivotally connected to said free ends of the link members 52, are links 53, 53. This construction is more particularly shown in Fig. 4, where it will be seen that the ends of the links 53 are hooked over pivot pins 102 and held in engagement therewith by tension spring 103. Thus the links 53, which are connected by the rod 53a, may be disconnected from the links 52 and the anvil hinged back to facilitate threading of the web of wrapping paper W between the knife and the anvil. Springs 104, 104 are connected to links 52 and to some part of the machine frame (not shown) to lift the links 52 when released from the hooks of links 53. The links 53 are pivoted at their other ends to arms 56 secured to the shaft 57 which is journaled at each end in the apron member 51.

The shaft 57 is rotated in a manner hereinafter described. When rotated anti-clockwise it will cause the arms 56 to swing downwardly pulling the links 52 and 53 downwardly and at the same time pulling the roller 44 down against the web W so that it holds the web under some tension in its perforating position. The anvil 49 is also pulled down into engagement with the cheeks 47 and depresses the cheeks causing blade 45 to press web W against the anvil and to cut a series of transverse perforations in the web. The cheeks not only serve to permit the web to pass over the blade when the blade and anvil are separated, as described above, but also serve to clamp the paper against the anvil preparatory to the perforating operation when the blade and anvil are being brought together.

Preferably, as shown in Fig. 7, strips of thin

gauge spring metal are secured to the sides of the channels 46 and 50 and bent to provide resilient guides 58 and 59 between which the web of wrapping material W passes. These guides space the paper from both the anvil and the cutting blade when they are separated. When the anvil and the cutting blade close together they are compressed. When the anvil and blade are separated after the cutting operation the spring strips strip the perforated portion of the paper W from both the anvil and blade to prevent it from sticking to the anvil or the cheeks of the cutting member.

The knife preferably cuts a series of transverse slots in the web. However, a row of small holes may be formed, or a continuous crease or partial cut, or a series thereof, may serve the purpose. It is to be understood that the words "perforate" and "perforations" are used as convenient words to describe a line of weakness or partial severance of the web.

#### *Actuating means for sheet perforating and severing means*

The means for operating the perforating mechanism are more clearly shown in a diagrammatic view, Fig. 4. An arm 60 extends between and normally above the plane of the upper surfaces of rollers 28 and 30, preferably, approximately midway of their length. The arm is adapted to move up and down, being depressed when a lift of papers is passing off the conveyor and projecting up after it has passed. The arm is pivoted at 61 to a bracket (not shown) which is secured to a fixed frame member, and has a contact arm 62 extending therefrom adapted to alternately engage contacts 63 and 64. The switch thus constructed will be referred to generally as switch 65 and the electrical connections are shown in Fig. 8 and will hereafter be described. A tension spring 62a is provided to pull switch arm 62 down normally into contact with contact 64 and hence to hold arm 60 in a normally "up" position.

The switch 65 controls an electrical circuit which includes a relay circuit hereafter described for actuating the coil of a solenoid 66. When a lift of papers is passing over rollers 28 and 30 the arm 60 will be depressed, causing the switch arm to engage contact 63. When the lift of newspapers has passed over the roller 28, the arm 60, being under upward pressure by spring 62a will tend to break through the line of perforation across the web of paper W. In fact, the paper is preferably completely severed at the point where the arm 60 engages it. In Fig. 3 the arm is shown as in the act of projecting through the paper. As pointed out before, when the arm rises, breaking through the paper at the line of perforation therein, the switch arm 62 engages contact 64, completing the circuit to and actuating the solenoid 66. The electrical circuit is illustrated in Fig. 8 and hereafter described.

The solenoid which is shown diagrammatically in Fig. 4, actuates a four-way sliding sleeve type air valve 67, the piston portion of which is normally retracted by spring 68. Inlet pipe 69 and exhaust pipe 70 provides a source of compressed air and exhaust to the valve 67. Details of the valve are not shown since they are not important but the valve is so constructed that when it is actuated by the solenoid, compressed air will be fed through the pipe 71 to the front end of the cylinder 72 causing the piston 73 to retract. Piston 73 is connected to arm 74 which is secured to the shaft 57 causing shaft 57 to rotate, pulling

the arms 56 downwardly and thus causing the anvil 59 to be pressed down on the cutting blade 45 as previously described. This clamps the web of wrapping paper W momentarily while it is being perforated. The friction between the lift of newspapers 1 and the rollers 30, 31 and 32 holds the portion of the web of paper which is underneath the pile of newspapers and continues to carry that portion of the web forwardly, so that the web of paper is torn along the line of perforation at the same time that a new line of perforation is being formed. The torn-off end of the web is then fed under the next lift of papers as previously described.

When the solenoid is de-energized spring 63 will reverse the valve, exhausting the front end of cylinder 72 and admitting air to the rear end of cylinder 72, through pipe 70a to return the piston to its original position. To de-energize the solenoid a limit switch 106 is provided (shown diagrammatically in Figs. 2, 3 and 4) which is actuated by the arm 56 to break the solenoid circuit when the perforating operation is completed.

#### *Positive web breaking mechanism*

To ensure that the web is torn along the line of perforation a breaking mechanism is provided actuated by the air cylinder. This breaking mechanism consists of three vertical bars 75, 76 and 77 shown clearly in Fig. 4 but also shown in Figs. 2 and 3 retained between guides 105, and adapted to pass between the rollers 28 and 38. The bar 75 is supported on vertical rod 78 and the bar 77 is supported on vertical rod 79, the central bar 76 being supported on rod 80 secured to a cross-bar 81. The rods 78 and 79 are pivotally connected to bell-crank levers 82 and 83 respectively which are pivoted to fixed transverse shaft 84. The other ends of bell-crank levers 82 and 83 are pivotally connected to rods 85 and 86 respectively and these rods are pivotally secured to arms 87 and 88 secured to shaft 57. By this arrangement of links and levers rotation of shaft 57 by means of air cylinder 72 will force the vertical bars 75, 76 and 77 upwardly against the web of wrapping paper W at the same time that the anvil is pressed down on the cutting blade to perforate the web, thus providing a positive breaking means for the web of paper along the line of perforation.

#### *Positive table lifting mechanism*

Although when the stack of paper passes off the control table, it will automatically lift out of engagement with the drive roller 16, it may be desirable to provide some positive means for initiating the lifting movement and this may be accomplished by means of a supplementary air cylinder 89 in parallel with the air cylinder 72, shown particularly in Fig. 4. This cylinder is mounted on frame member 13 and is connected to air cylinder 72 by a line 90 so that when air is admitted into the forward end of air cylinder 72 to actuate the perforating mechanism after the lift of papers has passed off the control table, air will also be admitted into air cylinder 89 causing the piston 91 to be pushed upwardly into engagement with the underside of the frame member 3 of the control table giving it a positive upward movement from the "down" position shown in Fig. 2 to the "up" position shown in Fig. 3.

#### *The electrical circuit*

The electrical circuit for actuating the sheet

perforating and severing means is shown diagrammatically in Fig. 8. Current from a source of power passes through wire 92, in which may be located the limit switch 106, to switch 65, being connected to switch arm 62 which is normally in the position shown in contact with contact 64. Contacts 93 and 94 of relay 95 are normally open. When the arm 60 is depressed, switch arm 62 is raised to engage contact 63 completing a circuit through the relay coil 96 and making the relay contacts 93 and 94. When the arm 60 raises after a stack of newspapers has passed over it, switch arm 62 will engage contact 64, completing a circuit through line 97, relay contact 94, and line 98 to the valve operating solenoid 66 thus actuating the air cylinder as previously described. The relay remains closed since the relay coil is in circuit through line 99 including contact 93. When the perforating operation is complete the limit switch 106 is opened and the relay circuit broken, breaking the relay contacts 93 and 94 and de-energizing the solenoid 66, thus the cycle.

What I claim as my invention is:

1. The combination of a control table, a receiving conveyor, a conveyor associated with the control table for carrying material off the control table to the receiving conveyor, means for driving the conveyors, means for feeding a web of wrapping material, having a transverse line of perforation beneath material as it passes from the control table conveyor to the receiving table conveyor, whereby the web is frictionally held between the material and the receiving conveyor and carried over the receiving conveyor beneath the material, and means for clamping the web while it is being carried over the conveyor to break the web along a line of perforation.

2. The combination of a control table, a receiving conveyor, a conveyor associated with the control table for carrying material off the control table to the receiving conveyor, means for driving the conveyors, means for feeding a web of wrapping material, having a transverse line of perforation, beneath material as it passes from the control table conveyor to the receiving conveyor, whereby the web is frictionally held between the material and the receiving conveyor and carried over the receiving conveyor beneath the material, means for clamping the web while it is being carried over the conveyor to break the web along a line of perforation, and means for forming another transverse line of perforation in the web while it is clamped.

3. The combination of a control table, a receiving table, a fixed frame on which the control table is mounted for movement relative thereto, a conveyor associated with the control table for carrying material off the table to the receiving table, means for feeding a web of wrapping material beneath material as it passes from the control table to the receiving table, said feeding means including a driving roller and guides for projecting the web from below the line of travel of the material upwardly between the control table and receiving table, and driving means for the conveyor and driving roller controlled by the movement of the table relative to the fixed frame for starting and stopping the conveyor and the web simultaneously.

4. The combination of a control table, a receiving table, a conveyor associated with the control table for carrying material off the control table to the receiving table, means for driving the conveyor, means for feeding a web of wrapping mate-

rial beneath material as it passes from the control table to the receiving table, means for transversely perforating the web at predetermined intervals in the length thereof, as it is fed to the receiving table, whereby said web may be readily completely severed after the material has been carried to the receiving table, and means for completely severing the web along a line of perforation after it has been fed beneath the material.

5. The combination of a control table, a receiving table, a conveyor associated with the control table for carrying material off the control table to the receiving table, means for driving the conveyor, means for feeding a web of wrapping material beneath material as it passes from the control table to the receiving table, and means for transversely perforating the web at predetermined intervals in the length thereof, said perforating means including a knife and an anvil between which the web passes, and means controlled by the material passing from the control table to the receiving table for causing the knife and anvil to grip the web between.

6. The combination of a control table, a receiving table, a conveyor associated with the control table for carrying material off the control table to the receiving table, means for driving the conveyor, means for feeding a web of wrapping material beneath material as it passes from the control table to the receiving table, and means for trans-

versely perforating the web at predetermined intervals in the length thereof, said perforating means including a knife and an anvil between which the web passes, means for causing the knife and anvil to grip the web between them, an arm engaging the under side of the web, means pressing the arm against the under side of the web with sufficient force to cause the arm to move upwardly on a line of perforation, and means actuated by the arm when it moves upwardly to actuate the means for causing the knife and anvil to grip the web between them.

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