United States Patent

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[54] **AUTOMATIC PAPER FEEDING UNIT**
2 Claims, 18 Drawing Figs.

[52] **U.S. Cl.** **83/205,**
83/210, 242/68.4

[51] **Int. Cl.** **B26d 5/20,**
B65h 75/02

[50] **Field of Search** 156/351,
352, 353, 510, 536, 554, 525, 510; 156/355, 356,
361, 364, 367, 368; 83/367, 636; 242/68.4;
226/14, 35, 36, 44; 83/209, 210, 369,
370, 372, 211, 208, 205

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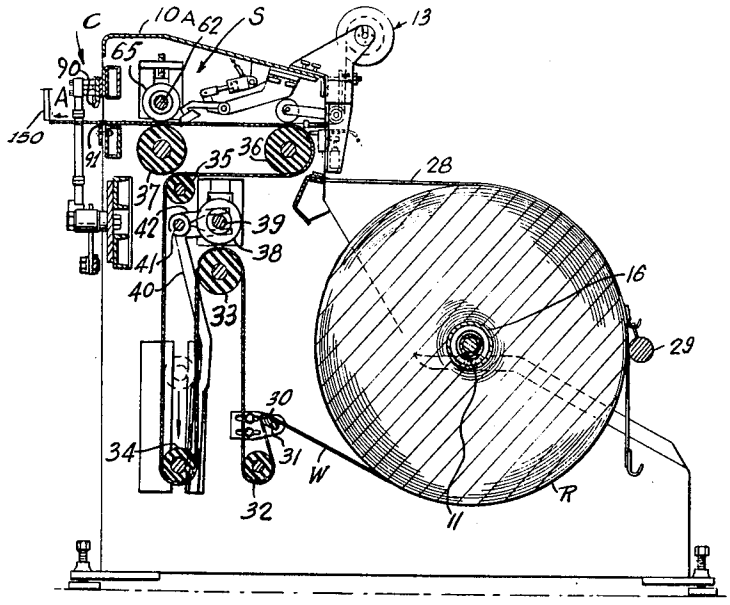
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ABSTRACT: The machine for producing blanks of paper from a roll of paper is provided with two separate feeding means. One feeding means feeds the paper out of the machine. The second feeding means is operated by the feeding of the paper by the first means to withdraw more paper from the roll of paper. As the paper is fed out of the machine by the first feeding means, it is cut into required lengths. The first feeding means is driven selectively by a continuously operating drive means. Further means can be provided on the machine for slitting the paper if required. Additional means can also be provided for applying a tear strip glued to the paper.



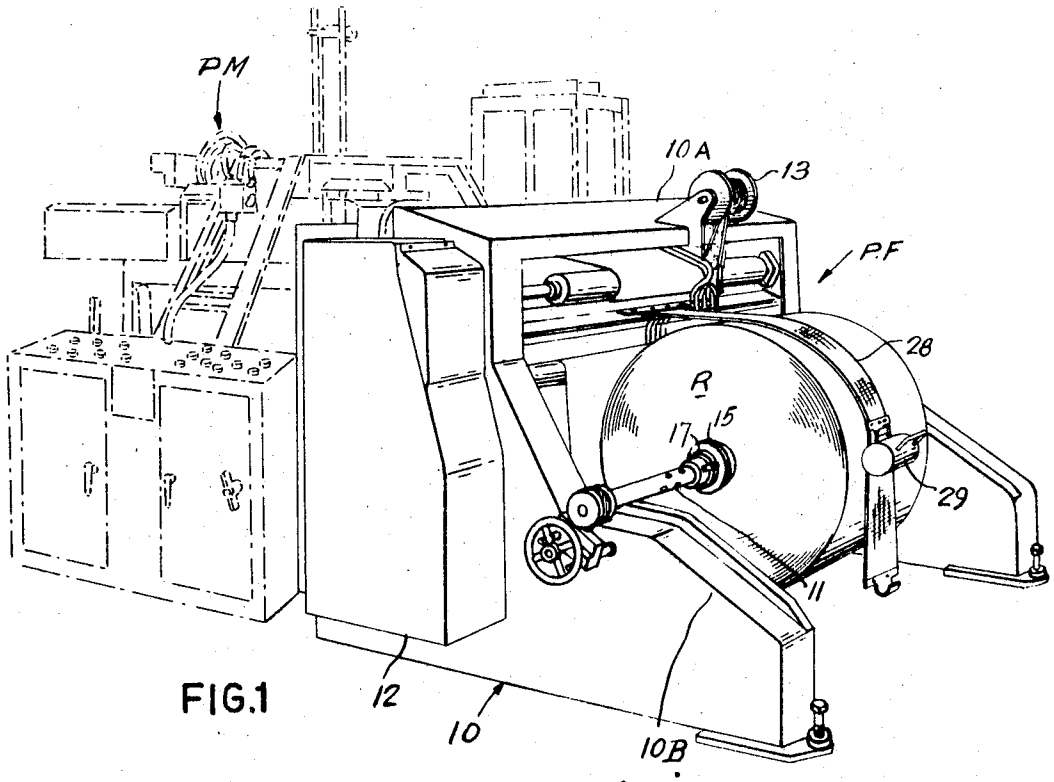


FIG.1

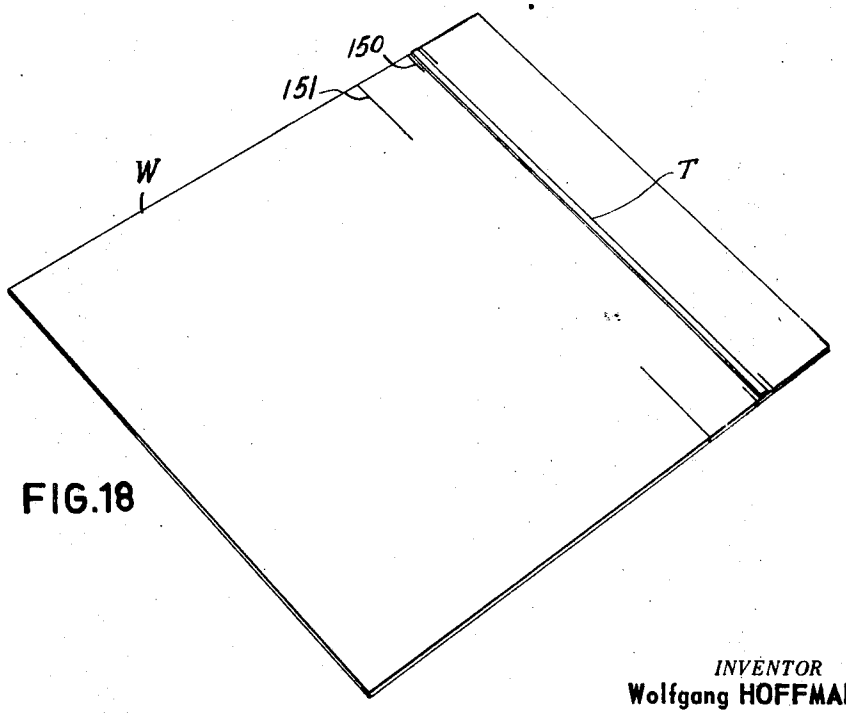


FIG.18

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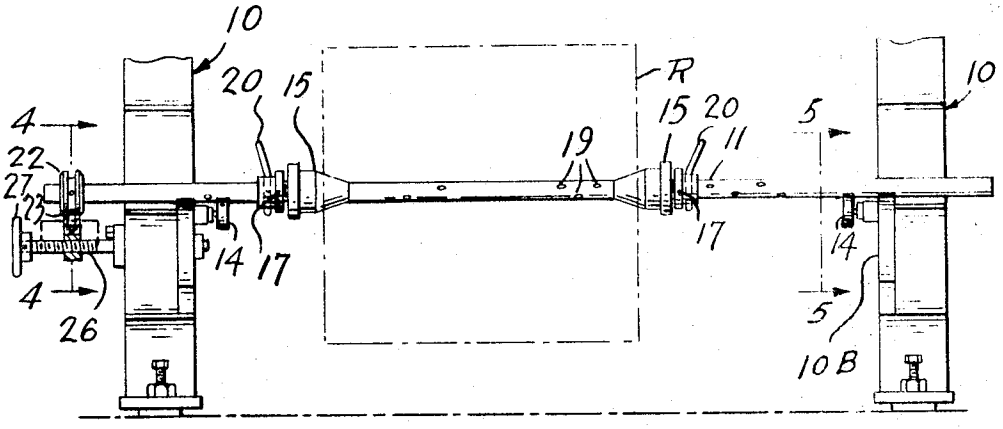


FIG.2

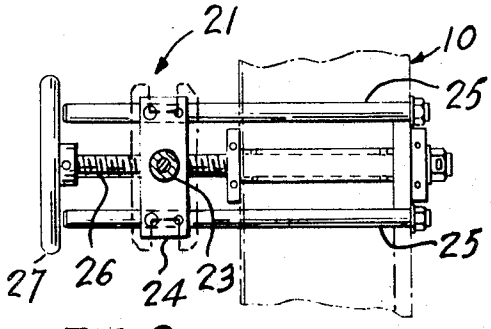


FIG.3

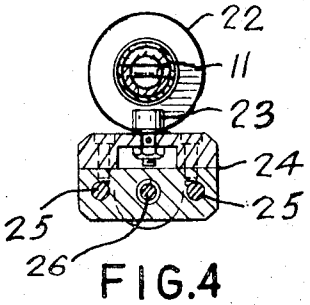


FIG.4

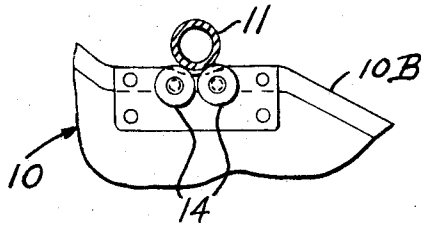


FIG.5

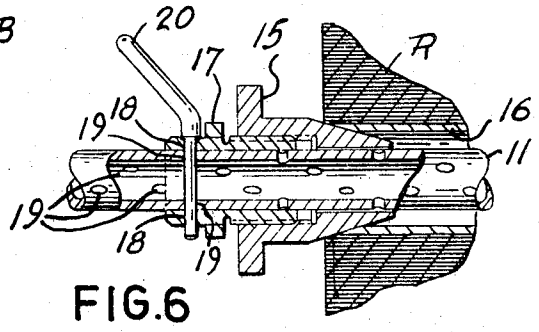


FIG.6

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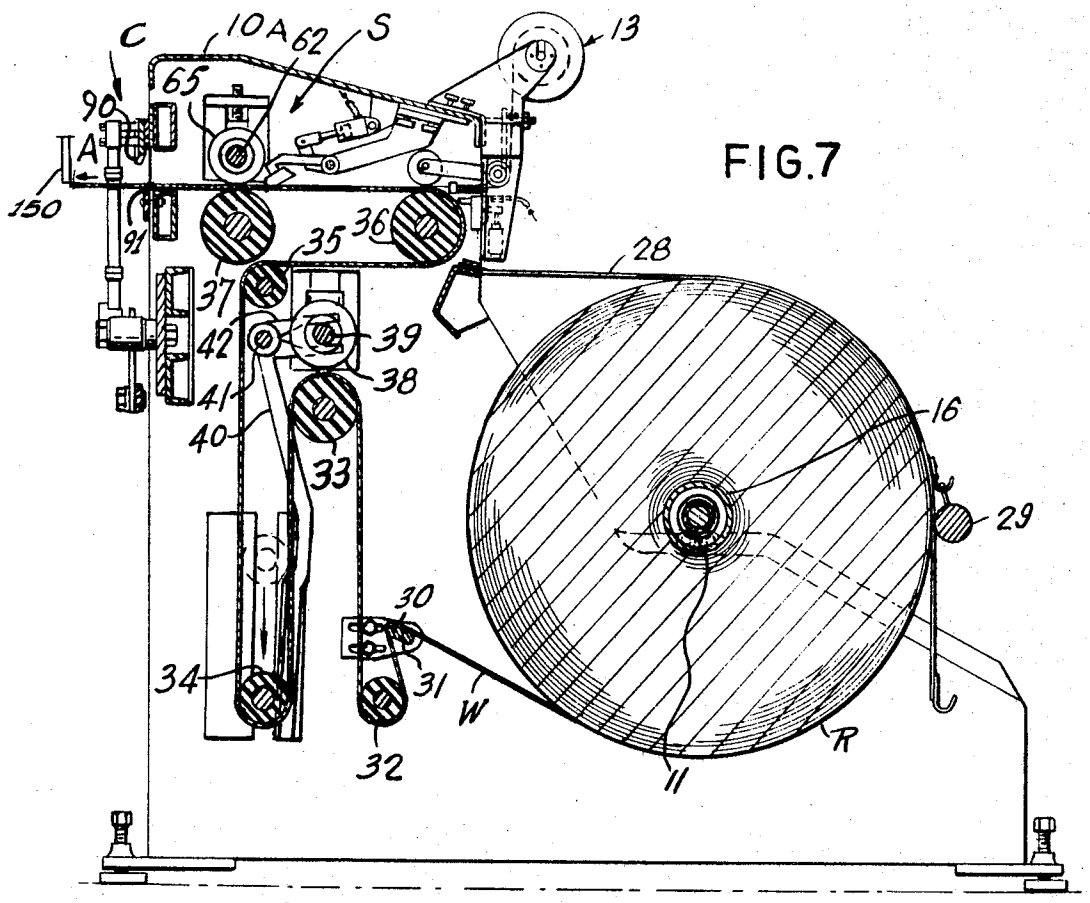


FIG.7

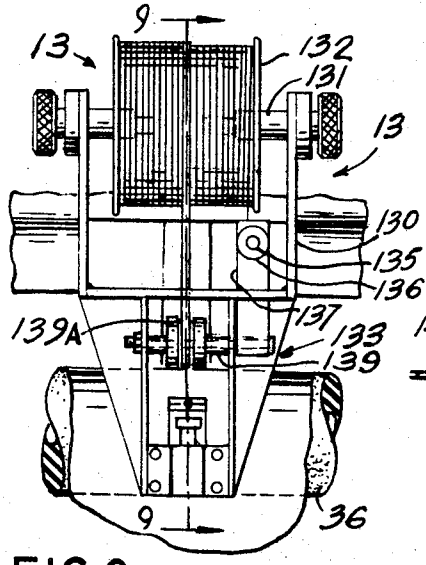


FIG.8

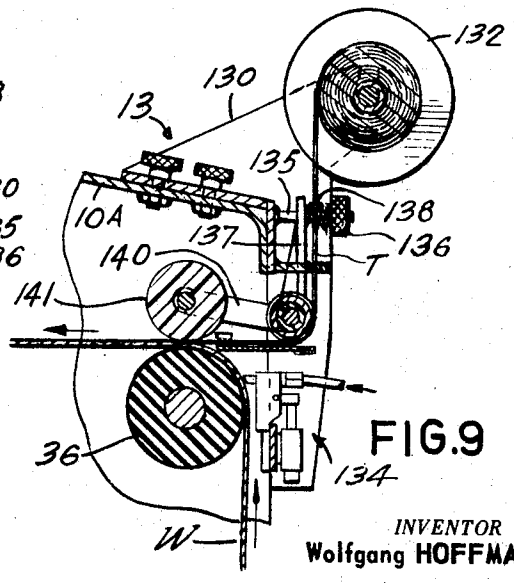


FIG.9

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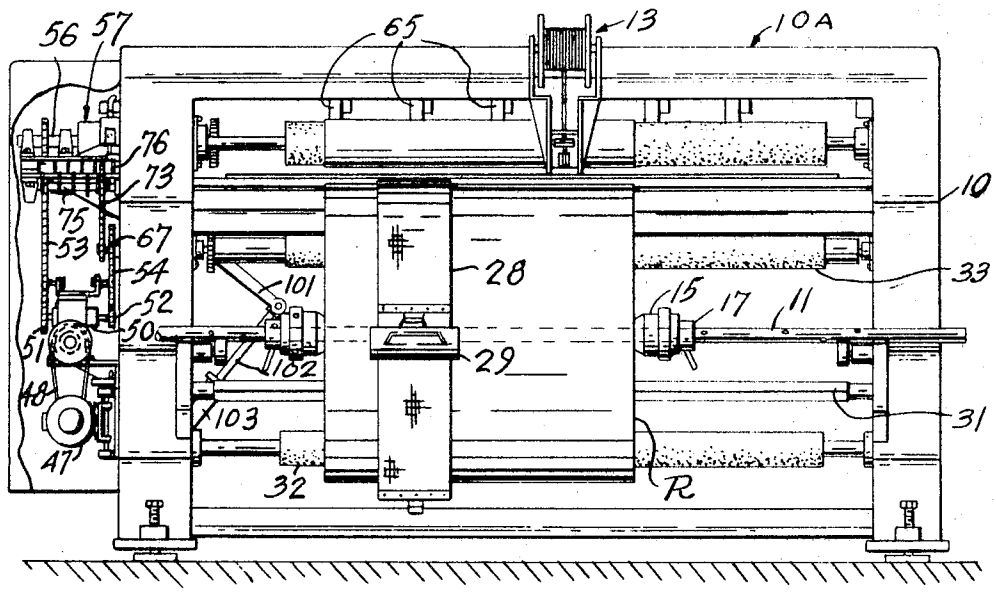


FIG.10

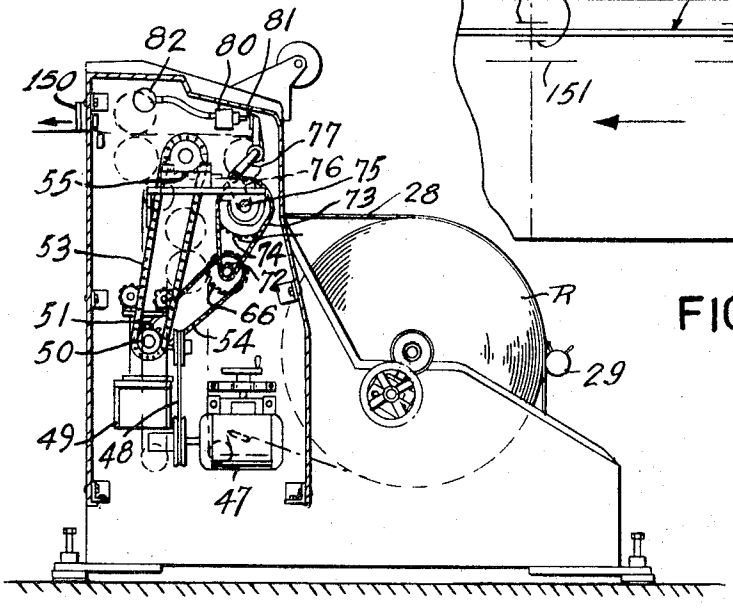


FIG.13

FIG.17

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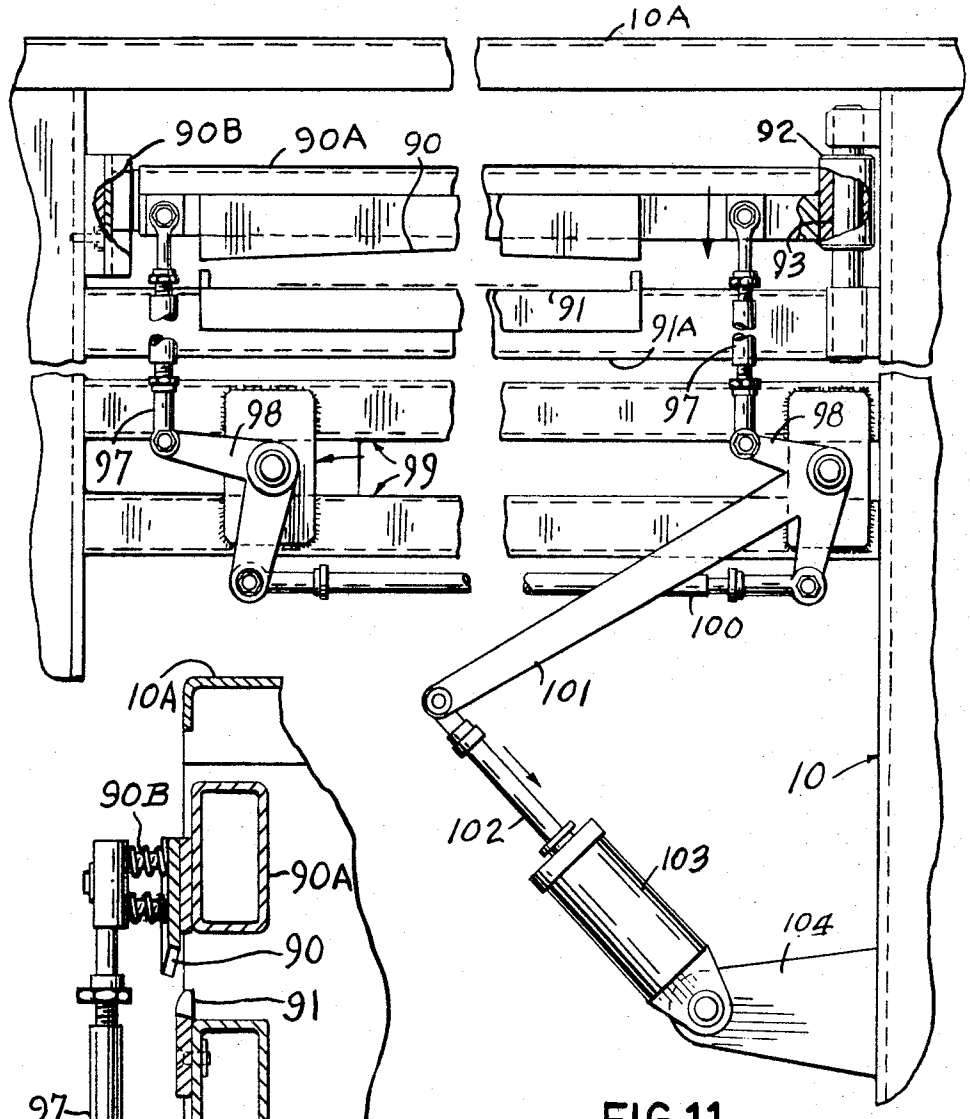


FIG.11

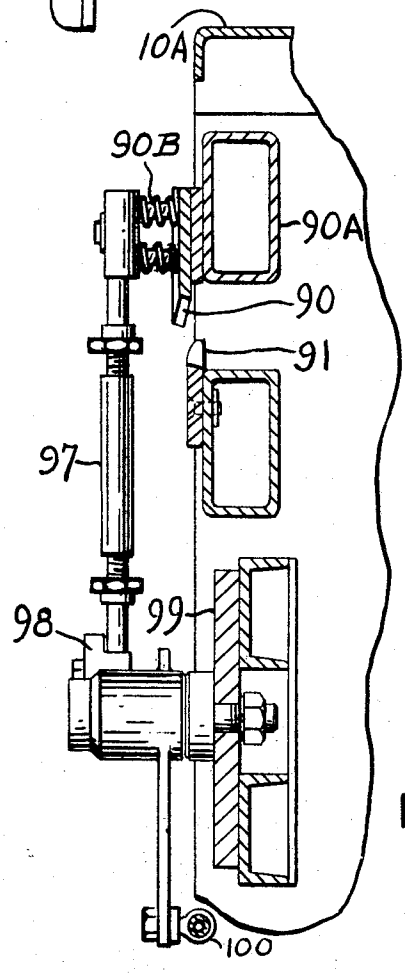
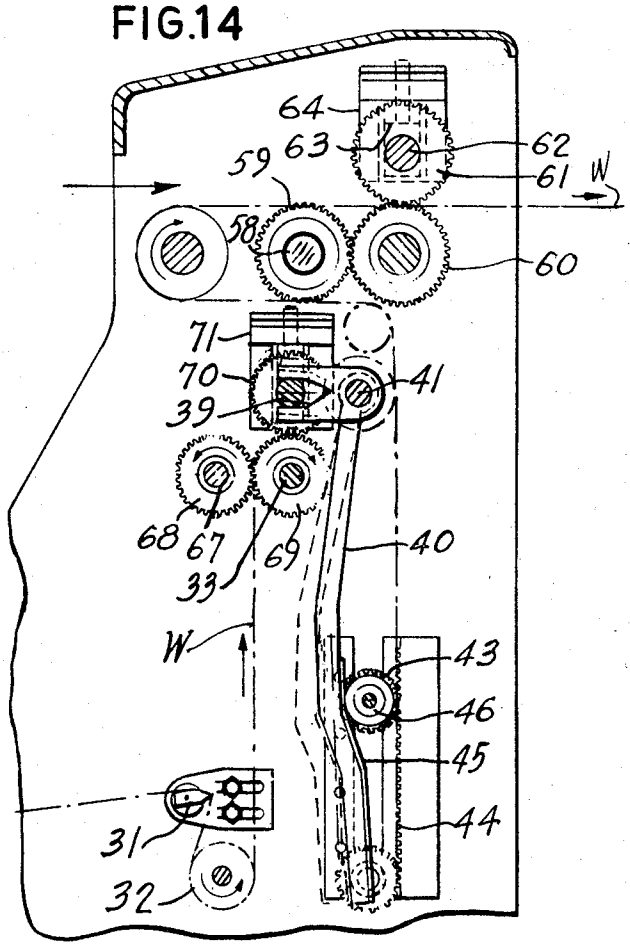


FIG.12

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FIG.14



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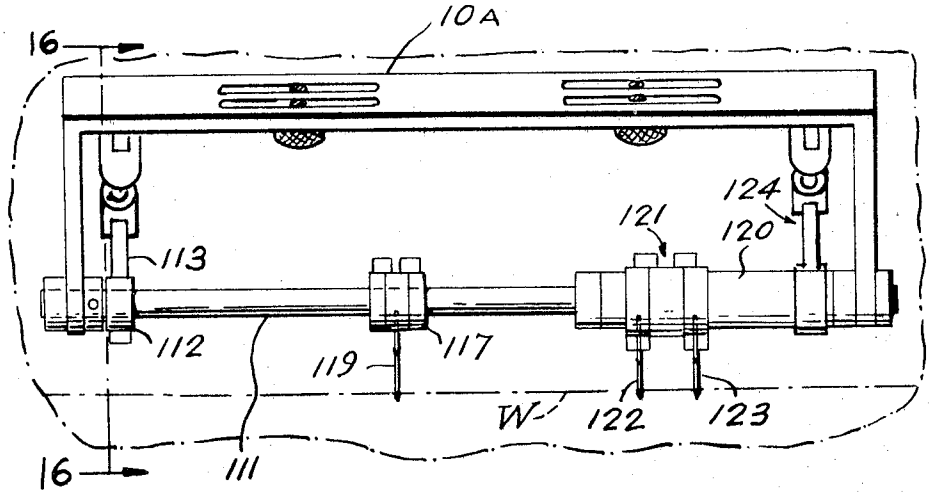


FIG.15

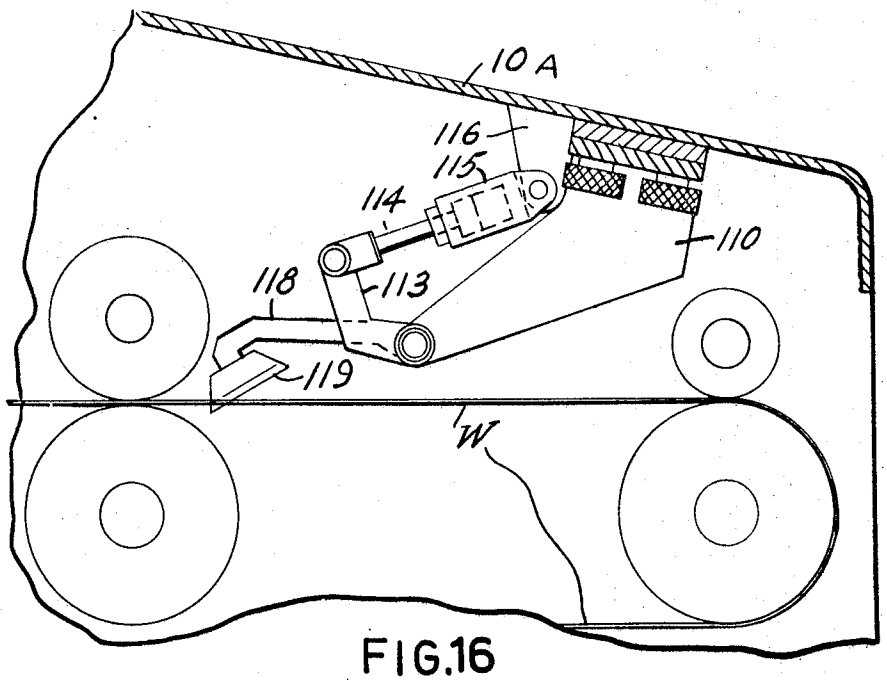


FIG.16

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AUTOMATIC PAPER FEEDING UNIT

This invention relates to a web feeding mechanism.

In the packaging industry the mechanism employed for feeding the wrapping material to the packaging machine conventionally includes means for unwinding the material from a reel and shears for severing the material into blank lengths. The mechanism continuously performs its operating cycle and it is necessary to provide suitable devices for preventing forward feed of the wrapping material until a blank is required by the packaging machine. This is a disadvantage in that such a machine requires components which have to be specifically designed to counteract the action of other components of the mechanism. A more important disadvantage arises from the fact that, as the mechanism cycles continuously its components are wearing while in fact the mechanism is merely cycling and is not performing any useful blank feeding function. Such idle cycles may constitute up to 20% of the operating cycles of the mechanism. The shears are particularly prone to wear during idle cycles as the cutting edges rub on one another without an intervening layer of wrapping material which has a buffering effect.

In accordance with the present invention there is provided a mechanism for supplying to a packaging machine a succession of blanks for wrapping purposes. The wrapping material enters this mechanism in the form of an elongated web and is fed forward and cut into blank-lengths by the blank producing mechanism. The means for feeding the web through the mechanism and the means for cutting the web into blank-lengths are actuated in synchronism with one another.

Preferably, the blank producing mechanism operates cyclically and receives its "starts" signal from the packaging machine itself when the packaging machine is in a condition to receive a further blank. This start signal gets in motion the means which feeds the web through the mechanism and according to an advantageous embodiment the leading edge of the advancing web is used to actuate a feeler member which then produces a signal indicating that measurement of a blank-length has commenced. Operating the means which feeds the web for a short period of time prior to beginning measurement of the blank length permits the feeding means to obtain a uniform speed of web travel and thus provides more accurate measurement of the blank length. A further detector, for example an electric eye adapted to detect a printed "spot" on the web, brings the measuring cycle to an end and brings the feeding means to a stop. This is virtually the end of a single operating cycle except in that the cutting mechanism then operates to sever a blank from the remainder of the web.

It will thus be understood that the mechanism which forms the subject of this invention does not have a fixed output rate but depends on the output of the packaging machine, that is to say, upon the frequency at which the "start" signal is received. The advantage of this is that there can be no pile-up of blanks should the product to be wrapped arrive at the packaging machine at an irregular rate with, for example, considerable time intervals therebetween.

Having thus generally described the invention the same will now be described in more detail with reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view of a packaging machine and in particular shows the web feeding mechanism;

FIGURE 2 is a front view illustrating the means for carrying a rolled web of wrapping material;

FIGURE 3 is a horizontal cross-section through a fine adjustment arrangement for the web roll;

FIGURE 4 is a vertical section taken on the line **4-4** of **FIGURE** 2;

FIGURE 5 is a view showing the supporting means for the shaft which carries the web roll, the view being taken on the line **5-5** of **FIGURE** 2;

FIGURE 6 is a vertical cross-section through a device for centering the web roll on its supporting shaft;

FIGURE 7 is a vertical cross-section showing these components of the feeding mechanism around which the web is entrained;

FIGURE 8 is a partial front view of the web-feeding mechanism and illustrates the specific arrangement for feeding a tear strip into juxtaposition with the paper web;

FIGURE 9 is a vertical cross-section on the line **9-9** of **FIGURE** 8;

FIGURE 10 is a front view of the web feeding mechanism;

FIGURE 11 is a rear elevation of a cutting arrangement for separating the web into blanks;

FIGURE 12 is a vertical cross-section through the cutting arrangement of **FIGURE** 11;

FIGURE 13 is an elevation of the left-hand end of the machine (as viewed in **FIGURE** 10) and illustrates that part of the drive mechanism which is outside the side frame of the machine;

FIGURE 14 is a diagrammatic view of the drive mechanism, and illustrates that part of the drive mechanism which is within the machine side frame, **FIGURE** 14 being to a larger scale than **FIGURE** 13 and looking in the opposite direction;

FIGURE 15 is a front elevation of a web slitting device;

FIGURE 16 is an end elevation of the web slitting device of **FIGURE** 15;

FIGURE 17 is a plan view of the web immediately prior to the web being cut by the cutting arrangement of **FIGURE** 11; and

FIGURE 18 is a perspective view of one wrapping blank cut from the web.

GENERAL ARRANGEMENT

The web feeding mechanism described in detail hereinafter is adapted to supply, from a web of suitable material, a series of wrapping blanks to a packaging machine of any suitable type. In **FIGURE** 1, the web feeding mechanism is designated PF and the packaging machine proper, referenced PM and shown in phantom outline, is preferably of the type disclosed in applicant's copending United States Continuation-in-part Application, Serial No. **416,929** filed December **8, 1964**, now Patent No. **3,354,600**. The web feeding mechanism includes a frame **10** which serves to support a shaft **11** upon which the roll R of paper is mounted. To one side of the frame **10** is mounted a casing **12** which contains the drive mechanism for the web feeding mechanism and also a timing cam arrangement for actuating the various parts of the web feeding mechanism in synchronism. Both the drive mechanism and the timing cam arrangement will be described in more detail hereinafter. A tear strip feed device **13** is mounted on an overhead member **10A** of the frame **10**. This feed device is illustrated to a larger scale in **FIGURES** 8 and 9 and will be described in more detail hereinafter.

PAPER ROLL SUPPORT ARRANGEMENT

The roll R, as described, is supported on the shaft **11**, and the shaft **11** is supported at each end on a pair of rollers **14** (see **FIGURE** 5). If desired a third roller can be provided above and slightly to the left (as viewed in **FIGURE** 5) of the left-hand roller. To facilitate positioning of the shaft **11**, the part **10B** of the frame **10** is made in the form of a ramp up and down which the shaft **11** can be rolled from its position supported on the rollers **14**. To locate the roll R on the shaft two devices for locating and centering the roll are provided. An example of a suitable centering device is shown in detail in **FIGURE** 6. This device consists of a cone-shaped member **15** which can be entered into the gap between the shaft **11** and the core **16** of the roll R thereby to center the core **16** with respect to the shaft. The device further includes a substantially cylindrical member **17** which is externally screw-threaded and which mates with internal screw-threading of the member **15**. A pair of holes **18** are provided in the member **17** and a number of pairs of holes **19** are provided in the shaft **11**. Pins, such as pin **20**, can be pressed through aligned holes **18** and **19** to lock the member **17**, and hence the member **16**, against axial movement. To locate the roll R one centering device is pressed against the roll and locked into position by inserting a

pin 20 through aligned holes 18 and 19. The other centering device is then brought to a suitable location against the roll R and a further pin 20 placed in aligned holes 18 and 19. One of the members 15, or both of them, can be turned with respect to the member 17 whereby the member 15 is displaced axially along the shaft and pressed into contact with the core 16.

The position of the roll R transversely of the web feeding mechanism can, of course, be coarsely adjusted by means of the centering devices described. However, to permit a fine adjustment of the position of the roll R a fine adjustment arrangement, generally indicated at 21, is provided. The shaft 11 carries a pulley 22 having a deep annular groove in the periphery thereof. A small roller 23, mounted with its axis vertical, is positioned in the peripheral groove of the pulley 22. The roller 23 is mounted on a block 24 which has two smooth rods 25 and a screw-threaded rod 26 passed therethrough. The rod 26 meshes with corresponding threading provided in the bore of the block 24. The rods 25 are fixed to the frame 10 and the rod 26 is mounted on the frame 10 in such manner as to be rotatable in its mountings. A handwheel 27 is provided on the free end of the rod 26. By turning the handwheel 27 the rod 26 is turned and the block 24, prevented from rotating by the rods 25, is displaced along the rods 25 and 26. This in turn displaces the roller 23 which is thus urged against one annular surface of the pulley 22. Consequently, the pulley 22 and the shaft 11 are urged axially so that fine adjustments of the position of the shaft 11 can be made.

Also associated with the roll R is a friction strap 28 which carries a weight 29. The strap 28 while permitting material to be drawn from the roll R, prevents reverse rotation of the roll and also halts the roll's rotation immediately the force exerted on the web and tending to unwind the web from the roll ceases.

WEB GUIDING COMPONENTS AND DRIVE MECHANISM

The web W as it is unwound from the roll R is fed across an edge 30 (FIGURE 7) having a small radius of curvature and formed on a member 31 extending transversely of the machine. The function of the member 31 is to eliminate, as far as possible, the tendency of the web W, which obviously will have been in its rolled form for a considerable time, to return to its rolled form when relieved of any constraining action. The web W is then fed around two rollers 32 and 33, both of which are mounted in bearings fixed to the frame 10, and then around a further roller 34 which is free to move in a vertical direction as will be described in more detail hereinafter. The roller 33 is driven as will be described. From the roller 34 the web passes adjacent further rollers 35, 36 and 37. While passing around the roller 36 the web W and the tear strip are brought into engagement and while passing from the roller 36 to the roller 37 the web is slit by the mechanism generally indicated at S. Subsequent to the slitting mechanism S the web encounters, and is cut into lengths by, a cutting arrangement generally indicated at C.

The roller 33 co-operates with a number of driving discs 38 which are mounted on a rotatable shaft 39. The manner in which the shaft 39 is driven will be described hereinafter. At each of its ends, the shaft 39 is supported by a lever 40 (see also FIGURE 14) which is pivotally mounted at 41. A horizontal portion 42 of the lever 40 is formed as a fork 42 and the shaft 39 is seated between the two prongs of the fork 42.

Each of the levers 40 is arranged to be oscillated by the roller 34 about which the web is entraned. For this purpose, the roller 34 carries adjacent each of its ends a ball bearing, the inner race of which is fast with the roller 34 and the outer race of which forms a rotatable cam. The roller 34 also carries a gear wheel 43 adjacent each of its ends and each gear wheel 43 co-operates with a vertical rack 44 secured to the frame 10 of the machine. Each lever 40 includes a track 45 upon which the outer race of the ball bearing, generally indicated at 46, runs. Vertical displacement of the roller 34 causes the lever 40 to oscillate from the full line position shown in FIGURE 14 to the position shown in phantom lines in that figure. Suitable guides are provided for restraining the roller 34 to travel in a vertical path.

The drive mechanism includes a main motor 47 (FIGURES 10, 13 and 14) which drives the web feeding mechanism via a chain 48 and reduction gearing 49. The output side of the reduction gearing drives a shaft 50 and the shaft 50 has two chain wheels 51 and 52 thereon. Chains 53 and 54 respectively are entrained around the chain wheels 51 and 52. The chain 53 is entrained around a further chain wheel 55 which itself is mounted on a shaft 56. The shaft 56 is connected to the input member of the clutch of a clutch and brake assembly generally indicated at 57. The output member of the clutch and brake assembly passes through the frame 10 and is referenced 58 (see FIGURE 14). This output member 58 carries a gear 59 which meshes with a further gear 60. The gear 60 in turn meshes with a third gear 61 which is itself mounted on a shaft 62. The shaft 62 is mounted in bearings which are themselves carried by blocks 63 (one of which is illustrated in FIGURE 14 and the other of which is at the opposite end of the shaft 62). The blocks 63 are mounted in vertical guides 64 and are spring-urged downwardly so that the gear 61 is pressed into mesh with the gear 60. The shaft 62 carries a plurality of discs 65 (see FIGURES 7 and 10) which co-operate with the roller 37. The springs which urge the blocks 63 downwardly also serve to urge the discs 65 into engagement with the roller 37.

The chain 54 is entrained around a further chain wheel 66 which is secured to a shaft 67. The shaft 67 passes through the frame 10 and carries a gear 68 which meshes with a gear 69 mounted on the shaft 33A of the roller 33 (see FIGURE 7). A gear 69 meshes with a further gear 70 which is mounted on the shaft 39. The bearings for the shaft 39 are mounted in blocks which are themselves in vertical guides generally indicated at 71. The blocks are spring-urged towards the shaft 33. This arrangement is similar to the mounting of shaft 62.

The shaft 67 carries a further chain wheel 72 about which a chain 73 is entrained. The chain 73 transmits drive via a chain wheel 74 and a slipping clutch to a cam shaft 75.

A mechanism for locking the cam shaft 75 in a predetermined angular position is provided, this locking mechanism consisting of an arm 76 projecting from, and rotatable with, the cam shaft 75 and a pivotably mounted number 77. The member 77 is spring-urged to the position shown in FIGURE 13 in which its lower end lies in the path of rotation of the arm 76 mounted on the cam shaft 75. An air cylinder 80 is provided which, when supplied with air, forces a plunger 81 against the pivotably mounted member 77 so as to rotate this member and displace its lower end out of the path of travel of the arm mounted on the cam shaft, thereby to free the cam shaft. Air is applied to the cylinder 80 by a valve 82 the control of which will be described hereinafter.

CUTTING MECHANISM

A cutting mechanism, generally referenced C in FIGURE 7, is provided for severing the web W into blanks of the desired length. The cutting mechanism includes a vertically displaceable cutter 90 (see FIGURES 11 and 12) and a fixed cutter 91. The cutter 90 has a cutting edge in the form of a shallow, inverted V and the cutter 91 has a straight, horizontal cutting edge. The cutters 90 and 91 are fixed on strengthening box-section members 90A and 91. At one end the member 90A is secured, for example by welding, to a bush 92 which is adapted to slide on a shaft 93. The other end of the member 90A moves in a vertical slideway 90B and the member 91A is fixed to the frame 10 at each end. The member 90A is adapted to be displaced vertically by a linkage including a pair of rods 97 and a pair of levers 98, one of which has two arms and the other of which has three arms. The levers 98 are pivotally mounted on a frame structure generally indicated at 99. A tie rod 100 joins other arms of the levers 98. The lever 98 including the third, longer arm 101 has that arm connected to a

plunger **102** of an air cylinder **103** which itself is pivotally mounted on a bracket **104** secured to the frame **10** of the machine. The mounting of the cutter **90** includes springs **90B** permitting restrained sideways movement of the cutter **90** with respect to the cutter **91** to permit the cutters to move one past the other.

SLITTING ARRANGEMENT

As will be seen from **FIGURES** 15 and 16 the paperslitting arrangement includes an inverted channel-shaped support **110** the depending arms of which rotatably support a transverse cross member **111** which is the form of a shaft. At one end of the shaft there is fixedly secured a collar **112** which is integral with a lever **113**. A plunger **114** of an air cylinder **115** is connected to the lever **113** and serves to oscillate the lever **113** and hence to rotate the collar **112** and shaft **111**. The air cylinder **115** is pivotally supported upon a bracket **116** depending from the frame part **10A**. Also rigidly secured to the shaft **111** is a further collar **117** from which extends an arm **118**, having a paper slitting blade **119** at the free end thereof. Towards its right-hand end (as viewed in **FIGURE** 15) the shaft **111** carries a sleeve **120** which is free to rotate about the shaft **111**. The sleeve **120** carries fast therewith a collar arrangement generally indicated at **121** from which extends two arms carrying two parallel blades **122** and **123**. An air cylinder generally indicated at **124** is connected to the sleeve **120** in the same manner as the air cylinder **115** is connected to the collar **112**. The air cylinder **124** serves to rotate the sleeve **120** about the shaft **111**. The cylinders **115** and **124** could be replaced by solenoid operated plungers or mechanical means such as cam devices.

The cylinder **115** is, in **FIGURE** 16, shown in its "operative" condition in which the arms **113** and **118** have been rotated with the shaft **111** in an anti-clockwise direction to bring the blade **119** into engagement with the web for slitting purposes. Air is supplied to the cylinder **115** from a suitable source (not shown) and includes within itself return spring means for returning the plunger **114** to its retracted position and consequently lifting the blade **119** away from the web immediately supply of air to the cylinder ceases. The blades **122** and **123** are actuated in a similar manner by the air cylinder **124**.

TEAR STRIP FEEDING ARRANGEMENT

The arrangement for feeding a "tear" strip into contact with the web W is illustrated in detail in **FIGURES** 8 and 9, and, as described above, has the general reference numeral **13** applied thereto. The arrangement **13** includes a bracket **130**, in the form of an upright channel section, mounted on the frame part **10A**. A rotatable shaft **131** is jounalled in the bracket **130** and extends transversely of the paper feeding mechanism. The shaft **131** serves to support a reel **132** upon which the tear strip is wound. The tear strip is indicated by the reference T. The device for **13** further includes a frame part, generally indicated at **133**, which depends from the bracket **130** and, for example, may be welded thereto. The frame part **133** serves to support a gluing arrangement generally indicated at **134** which serves to apply adhesive to the web W along a thin, strip-like zone of the web W. The gluing arrangement **134** can be of any suitable known form and its operation will be described in more detail hereinafter.

A short rod **135** projects forwardly from the bracket **130** and carries a knurled knob **136** on the free end thereof. The end portion of the rod **135** is screw-threaded and the knob **136** has corresponding internal threading whereby the knob **136** may be displaced along the non-rotatable rod **135**. The rod **135** passes freely through an arm **137** and spring **138** is disposed between the arm **137** and the knob **136**.

A stub shaft **139** extends transversely of the bracket **130** and parallel to the shaft **131**. The stub shaft **139** is suitably journalled in the frame part **133** and carries a roller **139A** having a deep peripheral groove therein. The tear strip T is seated in this groove and the roller **139A** serves to guide the tear strip so that it contacts the web W at the correct transverse location.

The arm **137** is fast with an arm **140** upon which a roller **141** is mounted. The spring **138** acts through the arms **137** and **140** urges the roller **141** downwardly against the tear strip T and squeezes the tear tape T and the web W between itself and the roller **36**. The stub shaft **139** passes through the arm **140** and acts as a pivot for the lever constituted by the arms **137** and **140**.

CAM ARRANGEMENT

The various parts of the feeding mechanism are operated synchronously by means of five cams which are mounted on the cam shaft **75**. The operation of these cams will be described hereinafter in detail when the operation of the described paper feeding mechanism is explained. Stated briefly, the cams have the following functions.

Cam **1** is used to measure the length of the web and at the same time resets the electric eye circuit when printed material is used.

Cams **2** and **3** respectively control supply of air to the air cylinders **115** and **124**. Consequently, these cams control the length of time that the blades **119**, **122** and **123** are pressed downwardly and hence determine the length and position of the slits which are made in the web W.

Cam **4** operates the gluing mechanism **134**. For example, the gluing mechanism **134** can be of the type in which there is a reservoir of glue and an air inlet to the reservoir to pressurize the same and expel glue through a nozzle. Consequently, the cam **4** determines the periods during which glue is supplied by the giving arrangement **134**.

Cam **5** controls supply of air to the air cylinder **103** and consequently controls the cutter mechanism C.

MISCELLANEOUS CONTROLS

The feeding mechanism includes a feeler for detecting passage of the leading edge of the web past a certain point. This feeler **150** is located to the left of the cutter mechanism (as viewed in **FIGURE** 7). Furthermore, the paper feeding mechanism includes a photo-electric eye (not illustrated) for detecting the passage of "spots" printed on the web W. This eye is associated both with cam **1** and with the clutch and brake assembly **57** as will be described hereinafter.

Before undertaking an explanation of the manner in which the paper feeding mechanism operates it should first be mentioned that the signal which initiates each cycle of the paper feed mechanism emanates from the packaging machine PM. That is to say, when the packaging machine PM can accept another sheet or blank of wrapping material a signal is transmitted to the clutch and brake assembly **57**. For example, a suitable microswitch or other detector can be provided in the packaging machine to detect passage of the previous wrapping blank past a particular location in the packaging machine.

OPERATION OF THE FEEDING MECHANISM

As mentioned immediately above the paper feeding mechanism operates cyclically and the signal setting the cycle in operation is received from the packaging machine when the packagaing machine is in a condition to receive a further wrapping blank.

During operation of the feeding mechanism, the motor **47** operates continuously. Consequently, the input member of the clutch assembly **57**, the gears **68**, **69** and **70** and hence the roller **33** and shaft **39** and the input member of the slipping clutch on the cam shaft all rotate continuously.

The signal from the packaging machine PM is received by the clutch and the brake assembly **57** and immediately releases the brake and engages the clutch so that drive is transmitted through the shaft **58** to the gears **59**, **60** and **61**. Consequently, the roller **37** and the shaft **62** are rotated and the paper web is fed in the direction of the arrow A, (see particularly **FIGURE** 7). To enable the desired length of paper web to

be fed to the packaging machine, the feeler **150** described above is provided in the path of travel of the web W to detect passage of the leading edge of the web. It will be understood that at the moment that the clutch and brake assembly **57** are actuated, the leading edge of the paper web is at the cutting mechanism C, that is, at the location at which the previous blank was severed from the remainder of the web. Locating the feeler **150** spaced from the cutter allows the feeding means to have the web running at uniform speed by the time blank measurement is to begin. If blank measurement were to begin at the same instant that clutch **57** was engaged, it is possible that the blank measure would not be the same in each case due to inherent play in the mechanical web drive means. The distance the feeler **150** is spaced from the cutter must be sufficient to begin measurement when the web is being fed at uniform speed. The signal from this feeler denoting passage of the web W is fed to the valve **82** which is than actuated to connect a source of compressed air (not shown) to the air cylinder **80**. The plunger **81** is then thrust to the right as viewed in **FIGURE** 13, and rotates the arm **77** clockwise about its mounting. The arm **76** on the cam shaft **75** is thus released so that drive to the slipping clutch becomes effective to rotate the cam shaft **75**. Immediately thereafter the arm **77** returns to its initial position so that it will arrest the cam shaft **75** after the cam shaft has completed a single rotation.

Immediately the cam shaft commences to rotate, the supply of air to the gluing mechanism **134** is commenced so that glue feeds onto the web W. In other words, cam **4** becomes effective to open the air supply to the mechanism **134**. During the previous cycle, a length of the strip T had been glued in the desired manner to the web W over that length of the web which lies between the mechanism C and the roller **36**. The movement of the sheet located between roller **36** and cutter mechanism C, having the tear strip glued thereon, outwardly to the packaging machine results in an additional length of tear strip T being pulled from the reel **132**. The strip is guided by the roller **139** into engagement with the adhesive-coated strip-like zone of the web W, the strip being pressed into engagement therewith by the spring-loaded roller **141**, so that the web and tear strip are firmly adhered together.

At suitable times during the cycle the cams **2** and **3** open the valves controlled thereby so that air is fed to the air cylinders **115** and **124** with the result that the blades **119**, **122** and **123** are urged downwardly and slit the paper. If reference is made to **FIGURE** 17 it will be seen that the blades **122** and **123** produce short slits **150** and the blade **119** produces a longer slit **151**. In other words, the air supply to the cylinder **115** continues for a longer period of time than does the air supply to the cylinder **124**.

The pull on the web as it is fed forward by the roller **37** and the discs **65** is insufficient to overcome the resistance that the strap **28** and weight **29** impart to the roll R. Consequently, the length of web between the roll R and the roller **37** shortens and this in turn has the effect of lifting the roller **34**, the movement of the roller **34** being of sufficient stroke to make available without rotating the roll R a length of web greater than that which is to be fed past the cutter mechanism C. As the roller **34** rises it acts as a cam, permitting the lever **40** to rotate in a clockwise direction (as viewed in **FIGURE** 7) about its pivot point **41**. As the roller **34** reaches the top part of its vertical travel the lever **40** pivots sufficiently far about its pivot point **41** to bring the discs **38** into engagement with the web and to grip the web between the discs **38** and the roller **33**. As mentioned, the roller **33** and shaft **39** are rotated continuously and the roller **33** and the discs **38** slip on the web W until such time as the discs **38** grip the web between themselves and the roller **33**. These components then serve to feed a length of the web W from the roll R, and as the length of web between the roll R and the cutter C increases the roller **34** descends once more. As the roller **34** reaches the bottom part of its travel the roller **33** and the discs **38** move out of engagement so that the web feeding mechanism constituted by these components ceases to operate.

The "spots" printed on the web are spaced apart in dependance on the desired length of the blank which is to be cut from the web. The photo-electric eye described above is actuated immediately one of these spots comes into co-operating relationship with the eye. The signal then produced by the electric eye is fed to the clutch and brake assembly **57** to release the clutch and engage the brake so that drive of the paper web immediately ceases, the roller **37** and shaft **62** being brought to an almost instantaneous stop.

To insure that the photo-electric eye does not transmit a signal to clutch and brake assembly **57** prematurely, for example, because of a dark colored mark or other blemish on the web, the cam **1** serves to "activate" the eye shortly before the "spot" on the web W reaches a position in which it co-operates with the eye. This minimizes the chances of improper and premature engagement of the brake and disengagement of the clutch. The cam **1**, after the clutch and brake assembly has been actuated, then renders the eye inoperative until late in the next cycle. It will be apparent that the electric eye can be located in any convenient position prior to and adjacent the cutting means.

The final stage in the cycle is the actuation of the cutting mechanism C by the fifth cam, this cam serving to open the valve which supplies air to the air cylinder **103** thereby to bring the top cutter **90** downwardly beyond the lower cutter **91**. In view of the shape of these two cutters the cutting action thereof is substantially that of scissors, the blank being cut inwardly from each edge towards the center as the cutters **90** and **91** progressively overlap.

As will be seen from **FIGURES** 17 and 18 the cutters **90** and **91** sever the blank transversely of the web through the slits **150** and **151**. The blank, once separated from the remainder of the web, is drawn into the packaging machine by a feed arrangement forming part of the packaging machine.

The slits **150** facilitate folding of the blank around the package to be wrapped, and the slits **151** permit the edge of the blank, once wrapped around the package, to be raised slightly so that firm grip may be had on the blank at one or other of the zones Z (**FIGURE** 18). By pulling on the strip T the package may be opened readily.

The above described operation can be summarized as follows:

(1) Signal received at assembly **57** to commence feed of web past cutter mechanism C.

(2) After a short distance of web travel, feeler **150**, located in the path of travel of the web from the cutter, detects the leading edge of the web and transmits signal to valve **82** to free cam shaft **75** for rotation.

(3) Cam **4** actuates the glue mechanism **134**.

(4) Cams **2** and **3** actuate slitting mechanism.

(5) Roller **34** rises to set in motion the web feed components which withdraw the web from the roll.

(6) Electric eye is "activated" by cam **1** and detects "spot" to disengage clutch and engage brake of assembly **57**.

(7) Glue mechanism ceases to operate.

(8) Roller **34** descends and the web ceases to unreel.

(9) Cutter mechanism is actuated by cam **5**.

(10) Eye is "deactivated" by cam **1**.

With a view to speeding up the operation of the paper feeding mechanism it is possible to employ air clamps for urging the shaft **39** towards the shaft **33** rather than to use the motion of the roller **34** for this purpose. This avoids the delay which normally occurs between the time that the roller **34** begins to move upwardly and the time that the discs **38** engage the web.

I claim:

1. A mechanism for producing wrapping blanks from a roll of sheet material comprising first means for feeding a length of material, second means located between the first means and the roll of material actuated by the feeding of the first length of material for withdrawing a further length of material from the roll, a continuously operative drive means, means for selectively connecting the drive means to said first feeding means to control operation of the first feeding means, and

means for cutting the material fed by the first feeding means into blanks after the first feeding means is disconnected from the drive means; the means for actuating the second feed means including a roller mounted to move vertically, the roller being moved vertically through the feeding of the sheet material through the first feeding means, the roller bearing against a pivotable cam lever during its movement, the roller causing the lever to pivot after having moved a predetermined distance to initiate operation of the second feeding means.

2. In a mechanism for delivering a succession of relatively short wrapping blanks produced from a relatively long web of wrapping material wound onto a central core to form a roll, means for supporting said roll comprising a mounting shaft, the mounting shaft being adapted to pass through said core, means for centering said core with respect to said shaft, means for locking said roll in position on said shaft to prevent movement thereof along said shaft, and means for permitting fine adjustment of the position of said shaft in the direction of its axis; the centering and locking means comprising a pair of two-part members, one part of each member being of conical form displaceable along said shaft and adapted partly to enter said core thereby to center said core, and the other part of each member being adapted to receive an element for fixedly securing said other part to said shaft, and said one and other members being connected to one another by screw-threading.