

[54] **METHOD OF COUPON POSITIONING AND MECHANISM THEREFOR**

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156/364; 53/120, 157, 117

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[57]

ABSTRACT

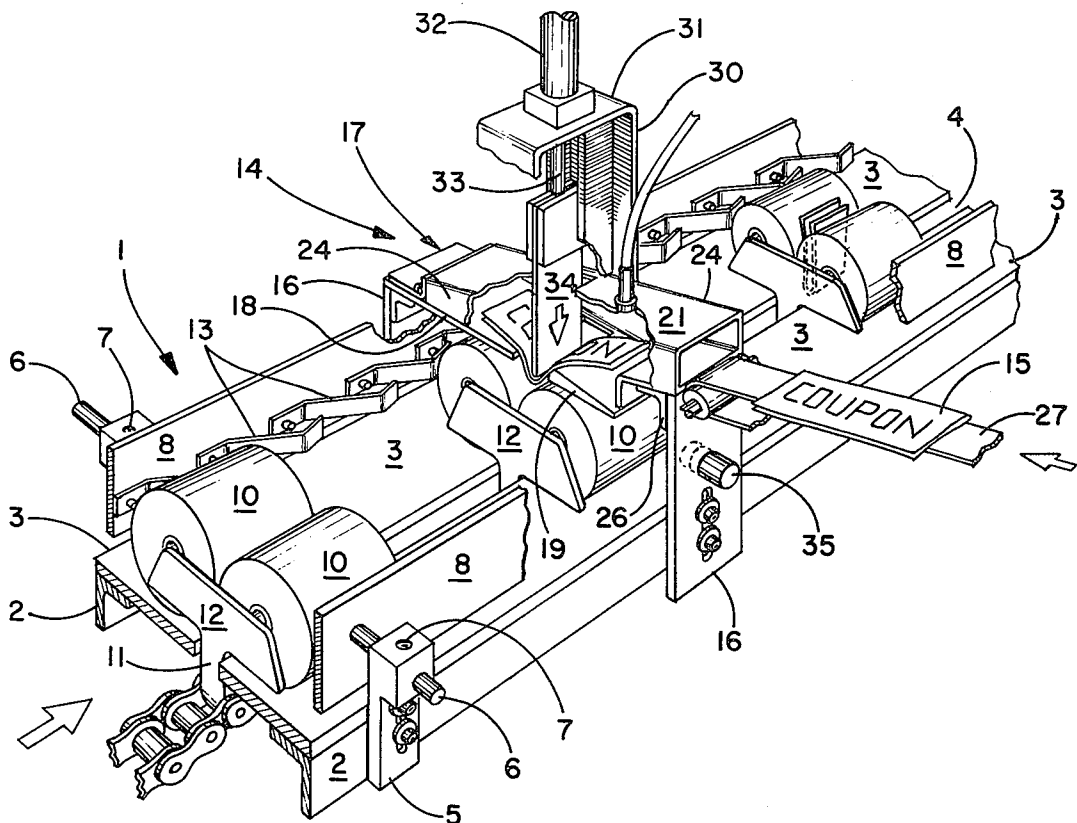
A method of applying a coupon to roll products such as paper toweling, toilet paper rolls and similar products, and a mechanism for carrying out the coupon application.

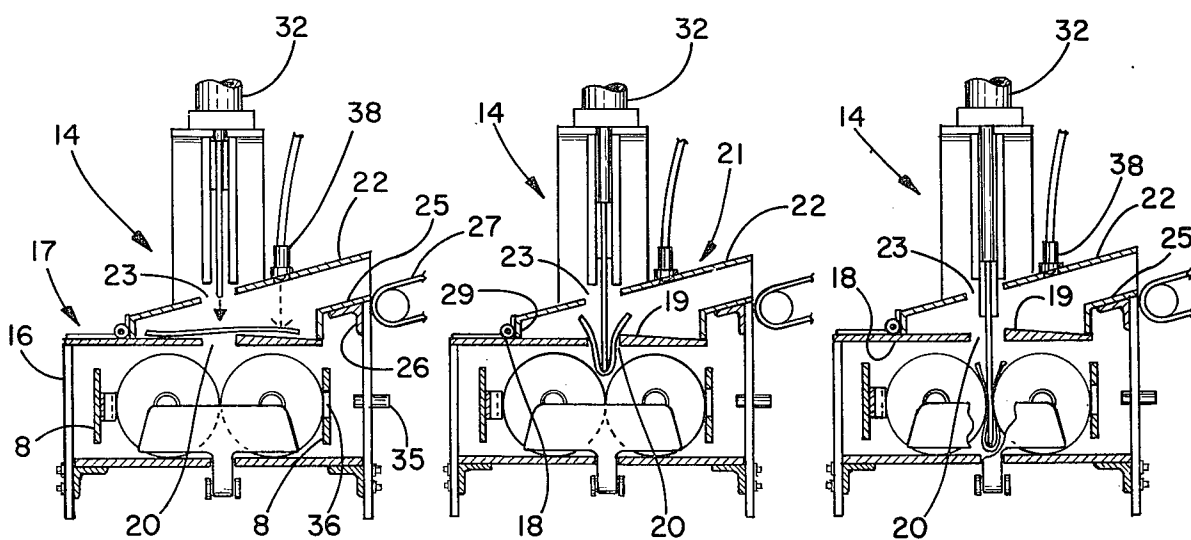
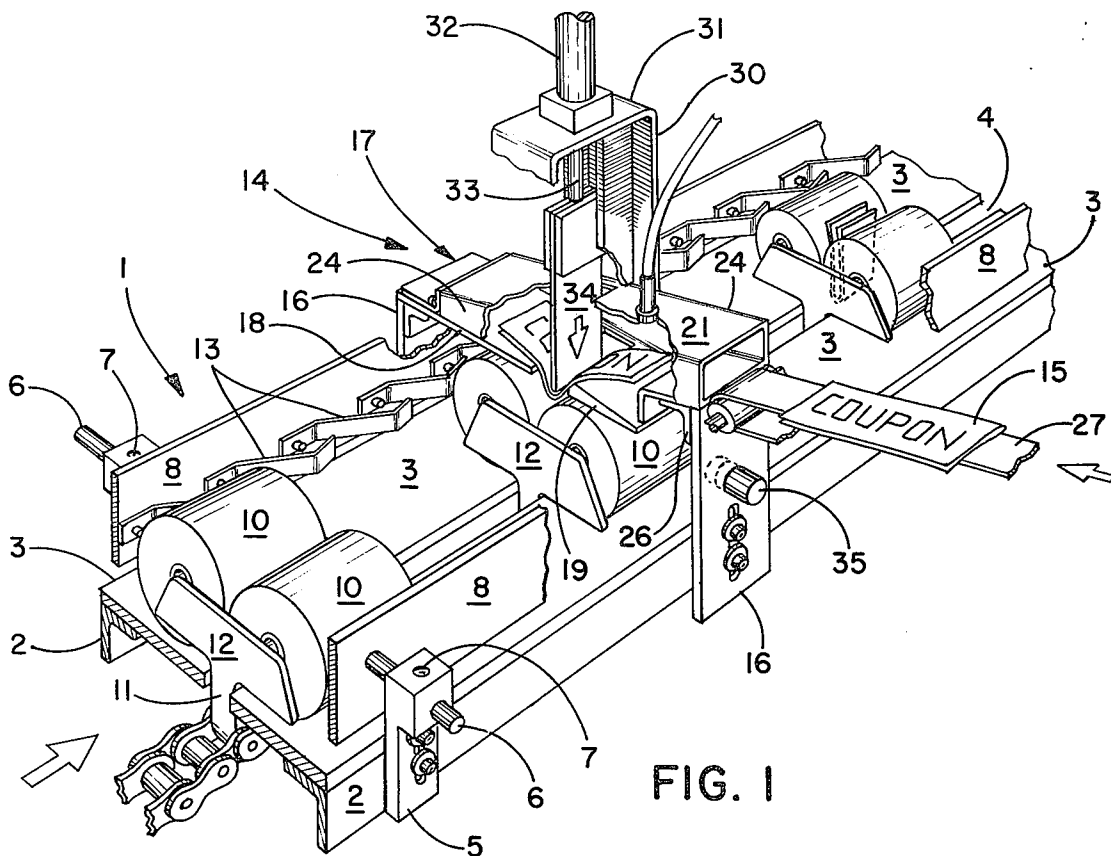
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3 Claims, 6 Drawing Figures





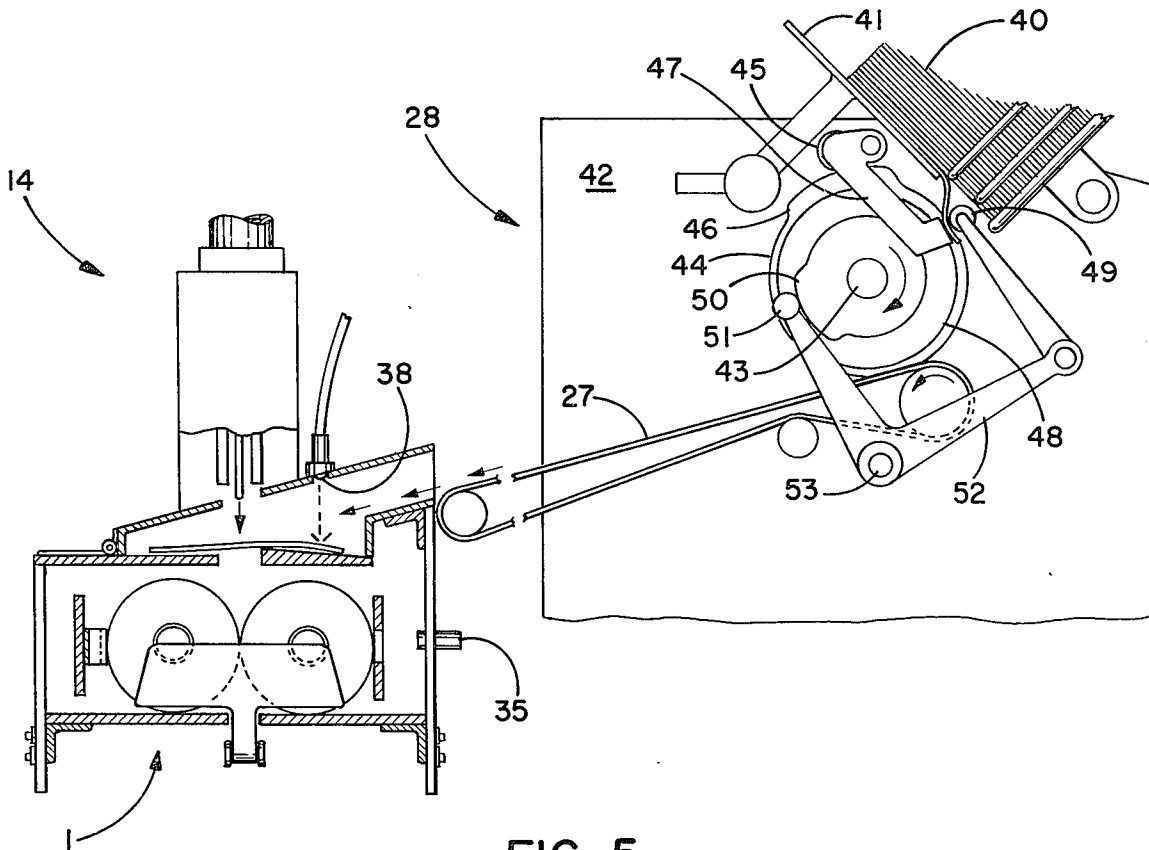


FIG. 5

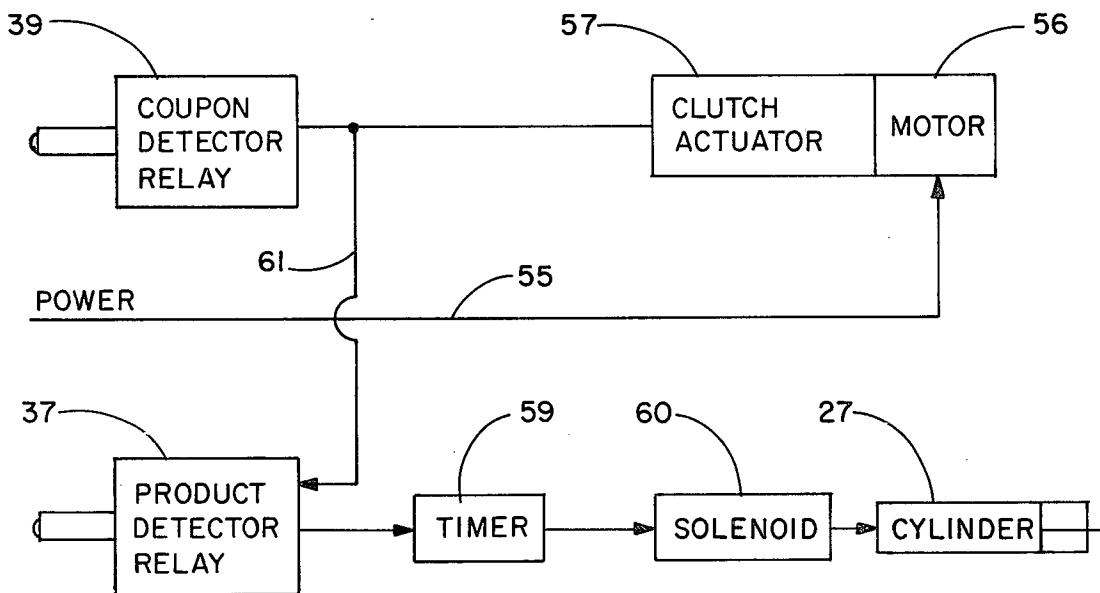


FIG. 6

METHOD OF COUPON POSITIONING AND MECHANISM THEREFOR

This invention relates to a method of securely applying a coupon to roll products by depositing the coupon between adjacent contacting peripheries of the rolls prior to wrapping of the roll products.

The invention also relates to equipment in the form of a coupon positioning mechanism whereby a coupon is tucked between the roll products to be wrapped. The mechanism is particularly useful in the application of coupons to products in multiple, very suitably products in tandem such as rolls of paper toweling, toilet paper and the like. The invention will be particularly described in connection with the application of the equipment to toilet paper rolls in tandem arrangement and wherein the coupon to be applied is flexible and is folded by the mechanism for tucking between adjacent paper rolls. The term "coupon" as employed herein will be understood to be in the form of a flexible sheet sometimes termed an inserter and the term "coupon" is not to be considered as limited to a particular type of printed material, promotional material or the like.

A particular object of the present invention is to provide mechanism to so apply a coupon to roll products to be wrapped that the coupon is well retained by the products with minimal possibility of coupon loss in subsequent wrapping operations.

A further object of the invention is to provide a novel method of inserting coupons into assemblies of products of commerce and wherein the coupons are releasably confined by the products through the product wrapping stage.

An important object of the invention is to provide equipment for the insertion of coupons in roll products in which the coupon attachment does not require adhesives or any retaining means other than the roll products themselves.

In more specific aspect roll products such as toilet paper rolls, towel rolls and the like have a degree of resiliency which varies with the particular product. In the method of invention two such roll products are retained resiliently together in side by side axial alignment with their peripheries contacting over their length such that a zone of contact or pressure is defined between them, and then taking advantage of the resilient nature of the roll products a coupon is tucked tangent to the roll peripheries and between the rolls so that the rolls securely grip the coupon.

The natural resiliency of the rolls may be supplemented by confining the rolls between supports, one of which is itself resilient, and such supports may bias the rolls immediately before, during and after the application of the coupon and until the rolls are wrapped.

The mechanism for effecting coupon positioning as described includes a station for coupon application with means for moving the roll products in tandem and axial alignment to said station, the station including a plunger which is operable in conjunction with slotted support means to both fold a coupon and tuck it between the adjacent roll products.

The invention will be more fully understood by reference to the following detailed description and accompanying drawings wherein:

FIG. 1 is a view in perspective of positioning mechanism for inserts and as illustrated particularly adapted for positioning coupons;

FIGS. 2, 3 and 4 are sectional views illustrating the sequence of steps of positioning a coupon between roll products such as toilet paper rolls;

FIG. 5 is a view similar to that of FIG. 1 but particularly illustrating conventional equipment for coupon feeding; and

FIG. 6 is a block diagram illustrating circuit components for control of the mechanism of FIG. 5.

Referring now more in detail to the drawings, numeral 1 generally designates a conveyor for rolls of toilet paper disposed in tandem in side by side axial alignment with their peripheries in contact over the lengths of the rolls. Such rolls of paper have a limited but significant resiliency and, when retained together as illustrated in FIG. 1, define in the area of peripheral contact a zone of pressure common to each roll.

A pair of oppositely disposed angle irons 2 extend longitudinally of the conveyor (FIG. 1) and support base members 3. The base members lie on opposite sides of a channel 4. Each angle iron 2 supports brackets 5, and each of which extends vertically, is adjustably mounted for vertical positioning with respect to the angle iron and carries a rod 6. Each rod 6 is adjustably positionable laterally of the conveyor and is fixed in position by a set screw 7. Side boards 8 are carried by a plurality of the rods 6 and extend longitudinally with the angle irons above the base members 3. As is apparent, the rods 6 are spaced along the length at convenient intervals sufficient to adequately support the side boards, the number of such rods shown in the drawing being limited for clarity in the drawing.

The rolls of paper are designated by the numeral 10 in the drawings. The rolls are pushed longitudinally on the base members 3 in the direction indicated by the arrow shown at the left of the drawing.

For this purpose tongues 11 of pushers 12 project upwardly from chain 9 and pass in the channel 4. The chain 9 is supported and moved by means not shown in a conventional fashion, the chain passing beneath the base members of FIG. 1 longitudinally.

As illustrated in FIG. 1, the pushers 12 each engage a pair of the toilet paper rolls 10. Side boards 8 are positioned inwardly of the lateral edges of conveyor 1 and are adjusted laterally by the positioning of rods 6 to confine the rolls 10 laterally and to bias the rolls towards each other. For the purpose of engaging the rolls in a resilient manner, a plurality of spring guide strips 13 are fixedly carried by one side board 8 as is most clearly shown in FIG. 1. Thus, one roll 10 of a pair of the rolls is engaged by the first and near side board 8 in FIG. 1 while the other roll is engaged along its outer circumference in an axial direction by successive flexible guide strips 13 as the rolls are pushed by the pusher 12 in the longitudinal direction. The rolls 10 are, accordingly, confined in side by side relation with their axes parallel and their peripheries in contact.

As shown in FIG. 1, the pushers 12 move the rolls longitudinally in pairs on the members 3 toward the coupon applying station 14. At station 14 a flexible insert of paper in the form of coupon 15 is tucked between the rolls 10. Station 14 on each side of the conveyor 1 has a vertically extending adjustably positionable bracket 16. Coupon support means 17 extend horizontally between the brackets 16. The coupon support means is formed by a single support 18 having a tapering rightward end 19 and a slot 20. The slot extends longitudinally in the direction of movement of the rolls 10 and the rolls in their movement are presented be-

neath the support means in alignment with the slot. Further, rolls 10 are, while beneath the slot, biased by the spring guide strip into resilient contact so that a zone of contact is provided between the roll peripheries.

Hinged to the support means 17 is a housing 21 having an upper closure 22 which extends angularly upwardly rightwardly over the support means and is itself provided with an opening 23 in vertical alignment (FIG. 1) with the slot 14.

Housing 21 at its rightward end (FIG. 1) is complete in a peripheral sense and rectangular in section, having opposed sides 24 and a partial bottom wall 25. The sides 24 extend over the full length of the housing. The partial bottom wall 25 is in the form of an angle and rests in the down position of the housing on angle iron 26 which is secured to bracket 16 adjacent the upper end of the bracket. Thus, the angle iron 26 acts as a stop for the housing 21. The bottom wall 25 serves as a chute for flexible inserts or coupons being fed to the support means 17 and this partial bottom wall is in communication with the upper strand of a feed belt 27 which carries the coupons from a source generally designated at 28 (FIG. 5). The housing protects coupons being fed from the effects of air currents and minimizes the problems leading to inaccurate coupon positioning. The downwardly depending small inner wall section 29 of housing 21 also serves as an abutment restricting coupon motion.

The remote (FIG. 1) side 24 of the housing 21 carries a mounting 30 having a horizontally extending portion 31 projecting over the slot 20. An air cylinder 32, only a portion of which is shown in the drawings, is supported by the mounting portion 31 and has a piston rod 33 which projects downwardly toward the slot 20.

Piston rod 33 terminates at its lower extremity in a relatively wide plunger 34 which serves as a tucker bar. Plunger 34 is selected to be of a thickness to pass through the opening 23 of housing 21 and the slot 20 of support means 17. The plunger also is selected to be of a width to securely contact a coupon positioned over the slot. As is apparent from the drawings, downward movement of plunger 34, upon actuation of the air cylinder, provides for movement of the plunger through opening 23, engagement of the plunger with the coupon and folding of the coupon as it urges the coupon through the slot 20 and downwardly between the rolls of toilet paper 10. The rolls of toilet paper particularly are of some resiliency and readily retain the coupon, this resilient action being supplemented in the preferred embodiment by the spring guide strips 13 when so desired.

The coupon applying station 14 includes equipment for sensing the presence of roll product beneath the support means 17 and this is interlocked electrically with means for both sensing the presence of a coupon over the slot 20 and controlling the movement of a coupon to the slot 20.

More specifically, the right hand bracket 16 (FIG. 1) carries a photocell 35 which is positioned opposite an opening 36 (FIG. 2) in side board 8 to permit the sensing of product 10 beneath the support means. The photocell 35 is in circuit with a relay 37 illustrated in block diagram in FIG. 6.

Closure 22 of housing 21 supports a second photocell 38 which detects the presence of a coupon on support means 17 and is in circuit with a relay indicated in the

block diagram of FIG. 6 at 39. The function of the photocells will be discussed more in detail hereinafter.

Referring now to FIG. 5 and the coupon source 28 and the dispensing equipment, numeral 40 identifies a stack of the sheet inserts (coupons) in the hopper 41. The dispensing equipment is conventional, forms no part of the present invention, is included only to permit for ready understanding of the complete machine operation, and is shown as carried on support 42.

The equipment at 28 includes a rotatable shaft 43 which is clutch controlled to stop and start the shaft by mechanism not shown. The shaft 43 is rendered operable intermittently, that is, caused to rotate when the photocell 38 senses the absence of a coupon on the support means 17. The shaft makes one complete revolution for each signal from the photocell. With shaft 43 rotating, the cam 44 carried fixedly on the shaft is also driven in rotation and cam follower 45 is transversely by the cam rise 46 to cause vacuum pickup arm 47 to move in a direction away from the hopper 41. Under this circumstance, the coupon illustrated in FIG. 5 as feeding from the hopper 41 is free to pass on the roll 48 away from the hopper being held temporarily in its initial movement between the roll 48 and nip roll 40. When the cam rise 49 has rotated with the shaft so that the rise no longer engages the follower, arm 47 returns to position.

As the shaft 43 rotates, a second cam rise 50 also moves and moves to engage cam follower 51 to cause bell crank 52 to pivot about shaft 53, withdrawing the nip roll 49 from the area of the hopper so that a succeeding coupon in the hopper may be contacted by the vacuum pickup arm 47, thereby permitting the succeeding coupon to be carried to the roll 48 and then to the belt 27 and support means 17. The completion of the traverse of the cam lobe or rise 50 beyond the follower 51 permits the nip roll to be again returned to the position of FIG. 5.

A control diagram for the mechanism described is shown in FIG. 6. As shown therein, power supplied through the line 55 drives electric motor 56 continuously. The motor 56 is connected to shaft 43 by conventional clutch means not shown. When the photocell 38 (FIG. 5) senses the presence of a coupon on the support means, the photoelectric relay 39 is actuated to cause the shaft 43 to be inactivated by disconnecting the clutch; in the absence of a coupon on the support means 15, photoelectric relay 39 is closed, thereby energizing the clutch actuator 57 to cause shaft 43 to be rotated, as already described, and a coupon to be fed. The photoelectric relay 39 is interlocked with photoelectric relay 37 which is itself closed by the presence of roll products 10 beneath the support means 17 as already described. With products present and a coupon on the support means and the relay 37 energized, a one-shot timer 59 is also energized and through a solenoid valve 60 in known manner provides for actuation of the fluid cylinder 32 and tucking of the coupon.

The interlocked connection is indicated in the connecting line 61.

The specific controls for the feeding of the coupons and the detection of product may vary widely and the invention is not to be considered as limited to particular forms of controls shown.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do

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not limit myself to the specific embodiments thereof except as defined in the appended claims.

We claim:

1. In coupon positioning mechanism for inserting coupons between roll products, support means for a coupon, said support means having a slot therein, means for moving a pair of roll products with their peripheries in contact and their axes parallel beneath the support means so that the zone of contact of the roll product peripheries is in vertical alignment with and extends parallel to the slot of the support means, means for delivering coupons one at a time to said support means to extend transversely across said slot, a reciprocable plunger mounted above said support means operably positioned in alignment with said slot to tuck a coupon on said support means through said slot and between said roll products at the zone of contact of the roll peripheries, means to drive said plunger vertically in reciprocation, said support means for the coupon having a first generally horizontal portion and a second portion also generally horizontal and nearer the means for delivery of coupons which second portion at said slot projects slightly above said first portion so that coupons delivered to said support means slide smoothly across said slot.

2. Coupon positioning mechanism as claimed in claim 1 and in which the second portion of the support

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means tapers upwardly in thickness toward the slot to provide the projection of the said second portion above the first portion of the support means.

3. In coupon positioning mechanism for inserting coupons between roll products, support means for a coupon, said support means having a slot therein, means for moving a pair of roll products with their peripheries in contact and their axes parallel beneath the support means so that the zone of contact of the roll product peripheries is in vertical alignment with and extends parallel to the slot of the support means, means for delivering coupons one at a time to said support means to extend transversely across said slot, a reciprocable plunger mounted above said support means operably positioned in alignment with said slot to tuck a coupon on said support means through said slot and between said roll products at the zone of contact of the roll peripheries, means to drive said plunger vertically in reciprocation, a closure over said support means having a top wall, side walls and a partial bottom wall extending adjacent said means for delivering coupons to the support means and serving as a slide over which a coupon enters to the said support means, said closure being in communication with the slot of the support means and protecting the support means from windage effects.

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