Nov. 1, 1938. M. J. MILMOE 2,135,090

FEED MECHANISM

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FIG. 1

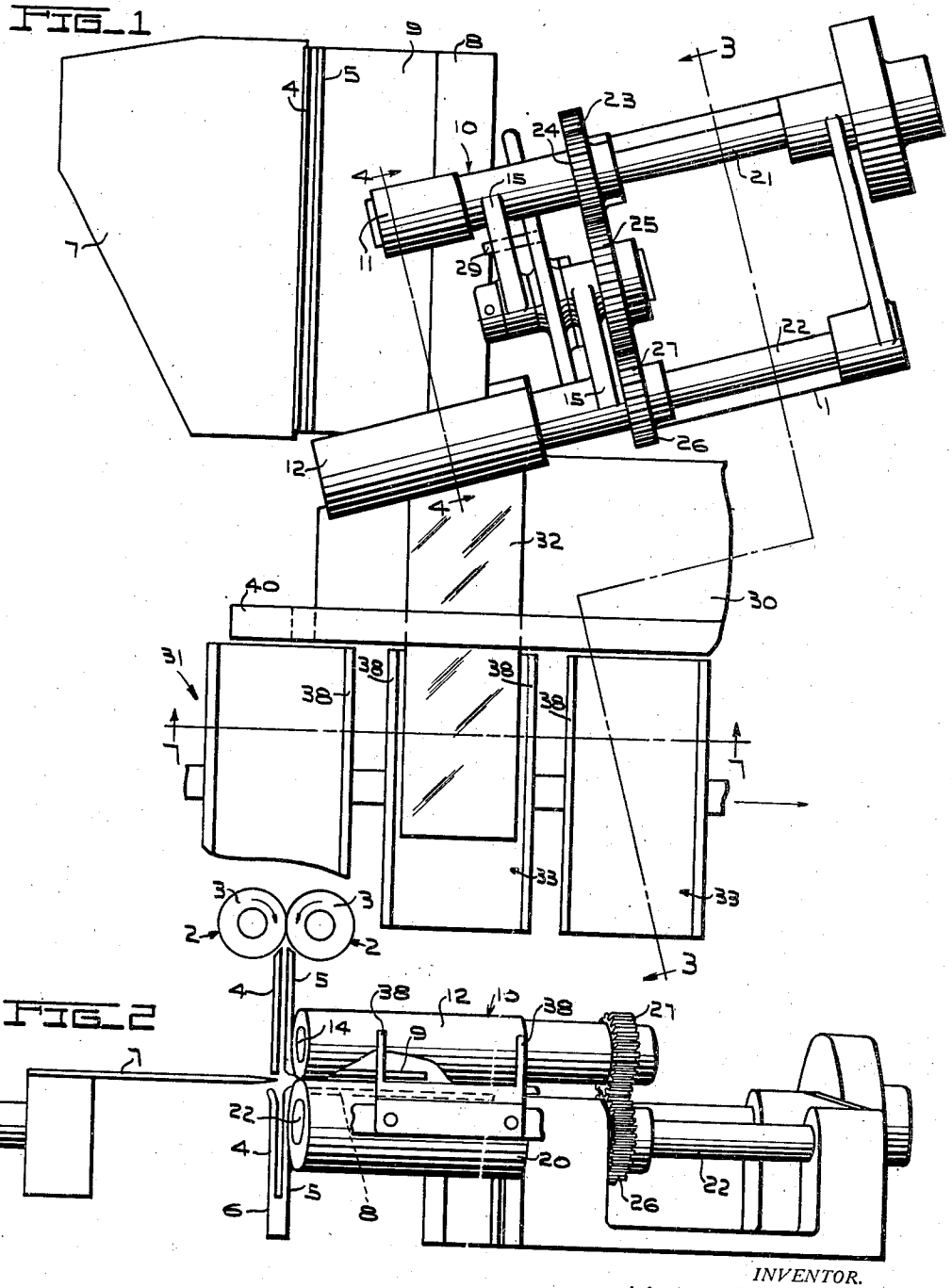


FIG. 2

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FEED MECHANISM

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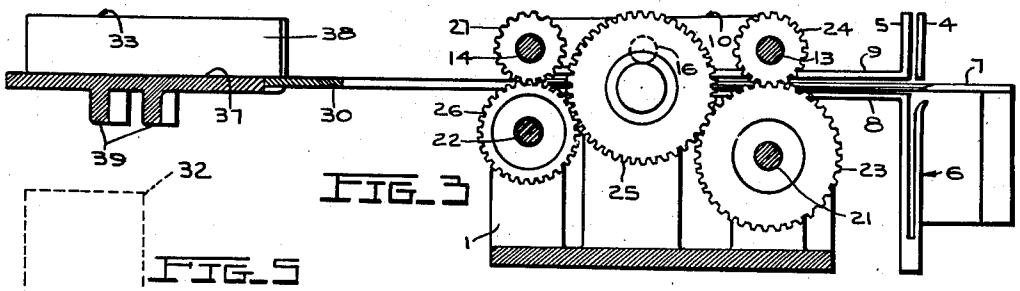


FIG. 3

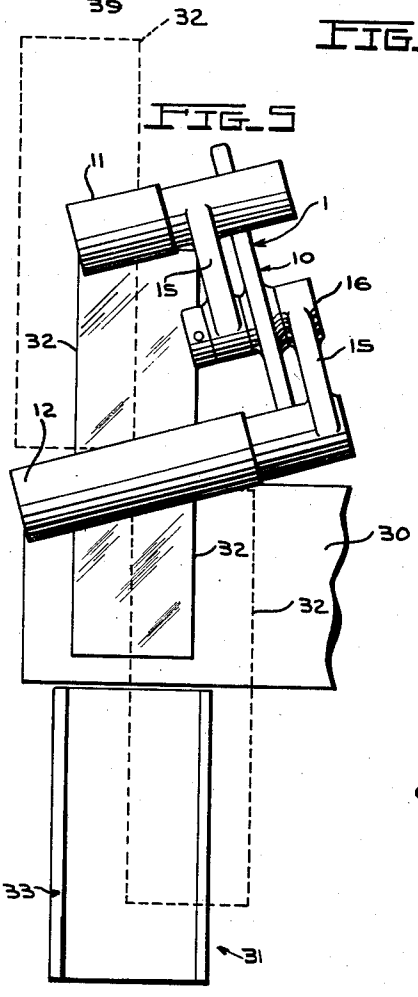


FIG. 5

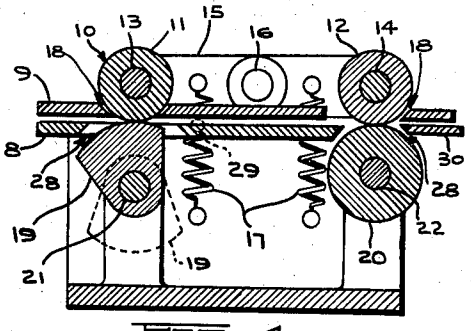


FIG. 4

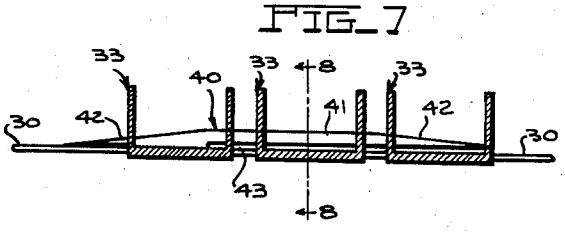


FIG. 7

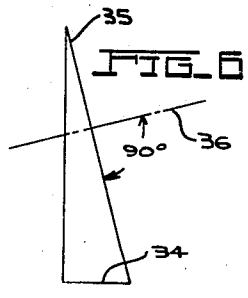


FIG. 6

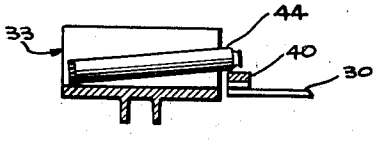


FIG. 8

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FEED MECHANISM

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FIG_9

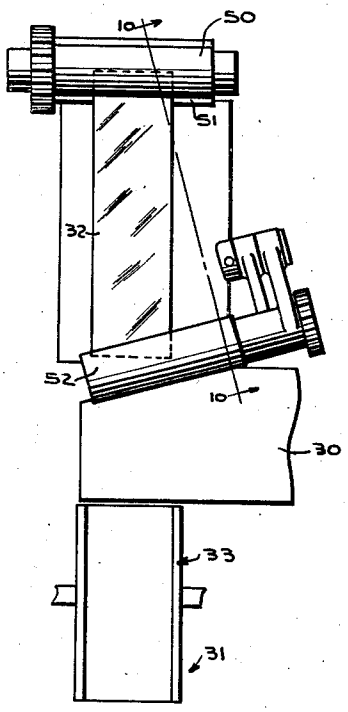
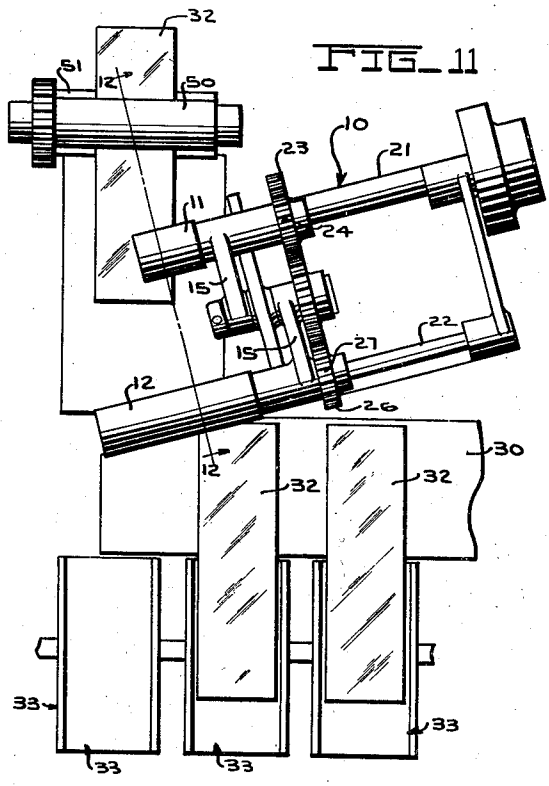


FIG_11



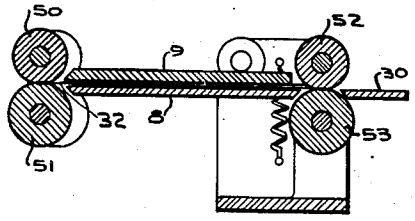


FIG_10

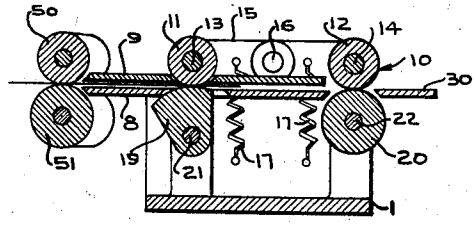


FIG_12

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Patented Nov. 1, 1938 2,135,090

UNITED STATES PATENT OFFICE

2,135,090

FEED MECHANISM

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Application August 22, 1936, Serial No. 97,405

15 Claims. (Cl. 271—51)

This invention relates to feed mechanism, and particularly to feed mechanism for feeding circulars or other advertising matter to a predetermined position whereby the circular may be incorporated with the article.

An important object of the invention is to provide a new and improved circular feeding mechanism whereby a circular is fed both transversely and longitudinally to a predetermined position with respect to a movable conveyor carrying an article, whereby the circular or other advertisement may be packaged in a suitable carton along with the article to be packed.

Another object is to provide means for feeding circulars whereby the circulars may be fed at a rapid rate of speed in proper timed relationship with a continuously moving conveyor.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail top plan view of a feeding mechanism and embodying the invention.

Fig. 2 is a detail elevational view of the feeding mechanism shown in Fig. 1.

Fig. 3 is a detail sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a detail transverse sectional view on the line 4—4 of Fig. 1.

Fig. 5 is a detail plan elevation of some of the mechanism showing diagrammatically the position of the circular as it is being fed through the device.

Fig. 6 is a diagrammatic or schematic view showing the relative velocity of the circular with respect to the relative velocity of the conveyor to determine the angular position of the feed rollers.

Fig. 7 is a detail longitudinal sectional view showing means for raising the article with respect to the conveyor whereby the circular or other advertising piece may be inserted beneath the article.

Fig. 8 is a detail sectional view on the line 8—8 of Fig. 7.

Fig. 9 is a detail plan section of a modified form of feeding roller mechanism.

Fig. 10 is a detail sectional view on the line 10—10 of Fig. 9.

Fig. 11 is another modified form of feeding mechanism.

Fig. 12 is a detail sectional view on the line 12—12 of Fig. 11.

Referring to the drawings, and particularly to Figs. 1 to 8 thereof, 1 designates generally a suitable frame or supporting structure, Fig. 2, on which there is operatively mounted or supported, by means not shown, suitable driving mechanism 2 comprising contacting rollers 3. The driven feed means 2 is adapted to feed a circular or other advertising medium or booklet between the spaced guides 4 and 5 of a circular supporting member 6.

A reciprocating folder blade 7 is operatively supported by certain members of the main structure 1, by means not shown, and is adapted to be reciprocated back and forth in proper suitable timed relationship relative to the feeding of the circulars through the driven feed mechanism 2. When a circular is fed in position in the circular holding or supporting means 6, the reciprocating folder blade 7 is adapted to fold the circular and feed it to the right, Fig. 2, between the circular supporting plate 8 and the circular guide plate or member 9 to a proper predetermined position with respect to the diagonal feeding mechanism 10.

The feeding mechanism 10 comprises a pair of upper rollers 11 and 12 which are mounted on suitable shafts 13 and 14, respectively. The shafts 13 and 14 are supported in suitable separate arms 15 which are pivotally supported on a central shaft or stud 16. Springs 17, Fig. 4, are fixed to a part of the supporting structure 1 and to the arms 15 and are adapted to urge the rollers in a downward direction. The rollers 11 and 12 have a part of their peripheral surface extending through slots 18 provided in the guide plate 9. These rollers 11 and 12 are adapted to contact with co-operating rollers 19 and 20. The rollers 19 and 20 are mounted on shafts 21 and 22, respectively, and these shafts are supported in suitable bearings operatively carried by the main part of the structure 1. A gear 23 is fixed to the shaft 21 and meshes with a gear 24 fixed to shaft 13, thereby driving the roller 11. The driven gear 23 meshes with an idler gear 25 which in turn drives gear 26 on the shaft 22. The gear 26 meshes with a gear 27 fixed to the shaft 14 thereby operating the rollers 12 and 20.

The rollers 19 and 20 extend through slots or openings 28 formed in the circular support 8 and have contacting relationship with the rollers 11 and 12, respectively.

The circulars as they are fed by the feeding mechanism 2 pass into the supporting mechanism 6 and are then fed between rollers 11 and

19 by the folder blade 7 where the circulars are engaged by the rollers 11 and 19.

The roller 19 is a segment roller, so that as a circular is being fed the engaging part of the segment roller 19 will be at approximately its lowered position as shown in dotted lines in Fig. 4, and allowing the circular to be properly placed and positioned between the rollers when the segment roller 19 is rotated and is in the position shown in full lines in Fig. 4 whereby this segment roller will be in engagement or contact with the roller 11 and the circular will be fed between the rollers 12 and 20. The folder arm 7 feeds the circular a sufficient distance into the rollers 11 and 19 to permit these rollers 11 and 19 to feed the circular between the rollers 12 and 20 after the blade has retracted. A stop pin 29, Fig. 1, carried by a part of the frame or structure 1 is positioned below the arm 15 which carries the roller 11 to prevent the springs 17 from urging the roller 11 too far downwardly into its slot 18 when the segment roller 19 is not in contacting engagement or relationship with the roller 11. The feed rollers 12 and 20 position the circular on a supporting surface 30 which may comprise a continuation of the plate 8.

A conveyor 31 moves to the right, Fig. 1, and is adapted to receive the circulars 32 as they are being discharged by the feed rollers 12 and 20. The conveyor 31 is adapted to move continuously at a predetermined speed and comprises a plurality of spaced pockets or buckets 33. The feeding speed of the circular is such that it will be properly positioned and received in one of the buckets 33 when the bucket reaches a predetermined position.

Inasmuch as the conveyor 31 is constantly moving, it is desirable and necessary that the circular be fed properly with respect to the bucket and at the proper speed so that the circular will be received and positioned in its proper respective bucket while the conveyor is moving and without mutilation in any way of the circular. In order to accomplish this arrangement, the feed mechanism 10 must be so constructed and arranged that the circulars will be fed longitudinally and transversely proportionately with respect to the movement of the conveyor. Therefore, the rollers 11, 12, 19 and 20 must be arranged at the proper angular position to feed the circular in its proper pocket and continue this feeding during the movement of the conveyor. The longitudinal speed of the circular should be such that it is equal to the speed of the conveyor which is in a longitudinal direction. By this arrangement the circular is always immediately opposite its corresponding pocket on the conveyor and in a parallel position with respect to the pocket while moving into it. To arrive at the angular position of the feed mechanism 10 the velocity of the pocket and the velocity of the circular must be taken into consideration, and this is shown diagrammatically in Fig. 6 wherein the bottom line 34 represents the velocity of the conveyor, while the line 35 indicates the velocity of the circular. The line 34 indicates the distance the conveyor travels in a given space of time, while the line 35 designates the distance the circular has to travel in the same given length of time. Therefore, where the line 35 intersects a line vertical to the line 34 the general diagonal axis of travel of the circular corresponds with the line 35, and the axis of the feeding mechanism 10 comprising the rollers 11, 12, 19 and 20, must be at right angles to this line 35. The axis of the rollers 11, 12, 19 and 20 is designated by the numeral 36, Fig. 6. Due to the angular position of the feed rollers 11, 12, 19 and 20, the circular 32 will be fed diagonally the proper distance at right angles to the bucket plus the distance the bucket moves. In other words, the longitudinal movement of the circular is equal to the longitudinal movement of the conveyor, and therefore the circular moves longitudinally at exactly the same speed as the conveyor. Therefore, when the bucket is in the position shown in full lines in Fig. 5 and the circular is also in the position shown in full lines in Fig. 5, the continued movement of the circular in a longitudinal direction and the continued movement of the conveyor in a longitudinal direction will cause the circular to be properly fed centrally with respect to the moving conveyor pocket. Some of the positions of the circular 32 are indicated in both full and dotted lines in Fig. 5, showing the course of movement of the circular, being both at right angles to the conveyor and moving longitudinally therewith.

The pockets or buckets 33, Fig. 3, may comprise a bottom or supporting portion 37 and side flanges 38, there being attaching lugs 39 provided to attach each of the separate pockets to the chain or mechanism. The relationship of the circular with respect to the bucket is at right angles to the bucket and is exactly the same as if the bucket were stationary and the circular were fed thereinto at right angles.

It is desirable that the circular being fed into its respective pocket be fed underneath an article which is carried by the pocket as the circular is to be enclosed in a package containing the article to be packaged. Therefore, in order to cause the circular to be fed underneath the article, means are provided to cause the article to be slightly raised as the circular is being fed into the bucket. This means is more clearly shown in Figs. 7 and 8 and comprises a plate 40 which is adjacent the conveyor at the edge thereof where the circular enters. This plate 40 has a portion 41 thereof raised above the horizontal line of travel of the circular with its ends inclined to form cam surfaces 42, there being a slot or opening 43 provided therein through which the circular passes as it is being fed into its respective bucket 33. Therefore, during movement of the conveyor the article designated generally by the numeral 44 will engage a cam surface 42 and be held in that position until after the circular is fed into the bucket and underneath the article. Then, after the circular has been fed in position the article will be caused to assume its original position as it leaves the other camway 42.

The circular folding and feeding mechanism is so timed with respect to the conveying mechanism that one circular will be discharged for every bucket as it moves to position.

In Figs. 9 and 10 the circular 32 is fed between spaced driven rollers 50 and 51 where they will be fed by straight movement to and between the diagonally positioned rollers 52 and 53. The rollers 52 and 53 are in all respects exactly the same as the rollers 12 and 20. The rollers 52 and 53 include the same mechanism and driving elements as the said rollers 12 and 20.

In Figs. 11 and 12 the feed rollers 50 and 51 are arranged in proper feeding relationship with respect to the feeding mechanism 10, therefore supplanting the previously described feeding mechanism designated by the numerals 2 to 7 inclusive.

The invention therefore provides means for

feeding a circular to its proper position with respect to a constantly moving conveyor by moving the circular at an angle in a direction transverse to the movable conveyor and at the same time longitudinally with the movement of the conveyor. However, the feed is in a relatively straight line, the circular being fed constantly from the time it is arranged in feeding position until it is arranged in the conveyor pocket.

The invention also contemplates means for raising the article during the time the feeding of the circular takes place so that the circular may be properly inserted underneath the article to be wrapped.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. Feeding mechanism comprising a conveyor movable forwardly in a longitudinal direction, said conveyor comprising a bodily movable receiving pocket, and circular feeding means comprising means for feeding the circular into the pocket at right angles thereto, while moving forwardly at the speed of the conveyor.

2. Feeding mechanism comprising a conveyor movable forwardly in a longitudinal direction, said conveyor comprising a bodily movable receiving pocket, and circular feeding means comprising means for feeding the circular into the pocket at right angles thereto while moving forwardly at the speed of the conveyor, the travel of the circular being at an angle to the directional movement of the conveyor, said feeding means comprising rotatable rollers.

3. Feed mechanism comprising a plurality of connected conveyor pockets, means for moving the pockets continuously in succession, means arranged at an angle to the longitudinal movement of said conveyor, and means for feeding a circular by said second named means at right angles to said conveyor.

4. Feed mechanism comprising a plurality of connected conveyor pockets, means for moving the pockets continuously in succession, means arranged at an angle to the longitudinal movement of said conveyor to feed a circular at right angles to the direction in which the conveyor moves, and means for operating the last named means.

5. Feeding mechanism comprising a continuous, constantly moving conveyor, said conveyor comprising a bodily movable receiving pocket, feed roller mechanism positioned at an angle with respect to the conveyor, and means including said feed roller mechanism for feeding a circular into said pocket at right angles thereto while moving forwardly at the speed of the conveyor.

6. Feed mechanism comprising a rectilinearly movable conveyor, said conveyor comprising a bodily movable receiving pocket, circular feeding mechanism spaced a predetermined distance from the conveyor, said mechanism comprising means for feeding a circular in a direction transversely toward the conveyor and also moving the circular in the same direction as the movement of the conveyor to deposit the circular into the moving pocket while moving forwardly at the speed of the conveyor.

7. Mechanism for feeding circulars to a rectilinearly moving conveyor having a bodily movable receiving pocket, comprising spaced upper and lower feed rollers positioned at an angle with respect to the movement of the conveyor, and means including the rollers for feeding the circular transversely and longitudinally with respect to the conveyor into said pocket at right angles thereto while moving forwardly at the speed of the conveyor.

8. Feeding means for feeding a circular into a moving pocket comprising means at an angle to the direction of movement of the pocket for causing the circular to travel into said pocket at right angles relative thereto and also in the direction of movement of the pocket.

9. Feeding means for feeding a circular into circular receiving pocket comprising means for moving the pocket in a predetermined direction, circular feeding means spaced a predetermined distance from the circular receiving pocket for feeding the circular into said pocket at right angles thereto, and means for moving the circular while it is being fed at an angle to the direction of travel of the circular receiving means.

10. Feeding means for feeding a circular into circular receiving means comprising means for moving the pocket in a predetermined direction, circular feeding means spaced a predetermined distance from the circular receiving means, and means for feeding the circular into said pocket at right angles thereto, said last named means also moving the circular while it is being so fed at an angle to the direction in which the circular receiving means travels.

11. Feeding device having means for feeding circulars successively to a predetermined position, a conveyor, said conveyor comprising spaced pocket members connected together for bodily movement, a feeding mechanism comprising feed rollers arranged at an angle to the conveyor for feeding the circulars in the said pocket members successively and at right angles thereto while simultaneously moving in the direction of movement of the conveyor, means for feeding the circulars successively from said predetermined position to said feed mechanism, and means for operating the conveyor at a speed substantially equal to the speed of the forward movement of said circulars.

12. In a device of the character described, a moving conveyor having a plurality of pockets containing articles with which circulars are to be associated, means for feeding such circulars in a direction transversely toward the conveyor and also moving the same in the direction of movement of the conveyor, and means for lifting the articles during the movement of the circulars into said pockets and beneath said article.

13. In a device of the character described, a moving conveyor having a plurality of pockets containing articles with which circulars are to be associated, means for feeding such circulars in a direction transversely toward the conveyor and also moving the same in the direction of movement of the conveyor, and stationary cam means for lifting the articles during the movement of the circulars into said pockets and beneath said article.

14. In a device of the character described, a moving conveyor having a plurality of pockets containing articles with which circulars are to be associated, means for feeding such circulars in a direction transversely toward the conveyor and also moving the same in the direction of

movement of the conveyor, and cam means having oppositely inclined end surfaces and a flat intermediate surface for lifting the articles during the movement of the circulars into said pocket, said cam having a longitudinal slot therein to permit passage of the circulars therethrough to positions in said pockets beneath said articles.

15. In a device of the character described, means for feeding a circular into the receiving pocket of a moving conveyor comprising circular feed rollers rotating about axes angularly inclined relative to the direction of movement of the conveyor for moving said circular transversely of and into said receiving pocket and also moving said circular in the direction of movement of the conveyor, and means for rotating the rollers at a speed proportionate to the movement of the conveyor to cause the circulars to move in the direction of the conveyor at a speed equal to the speed of the conveyor thereby to maintain the circular in register with the receiving pocket during its transverse movement thereinto.

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