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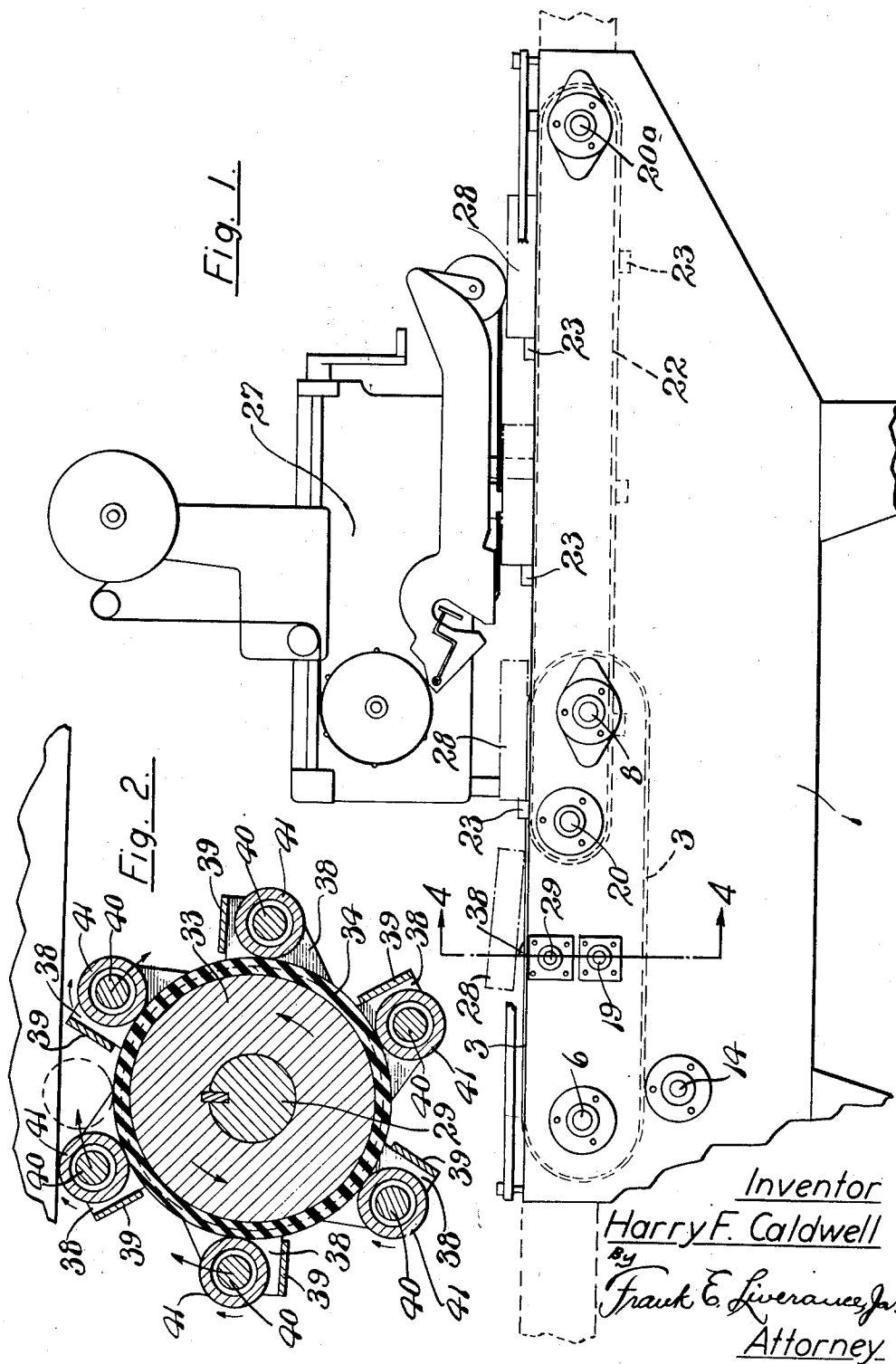
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LABEL MACHINE FEEDING AND TIMING MECHANISM

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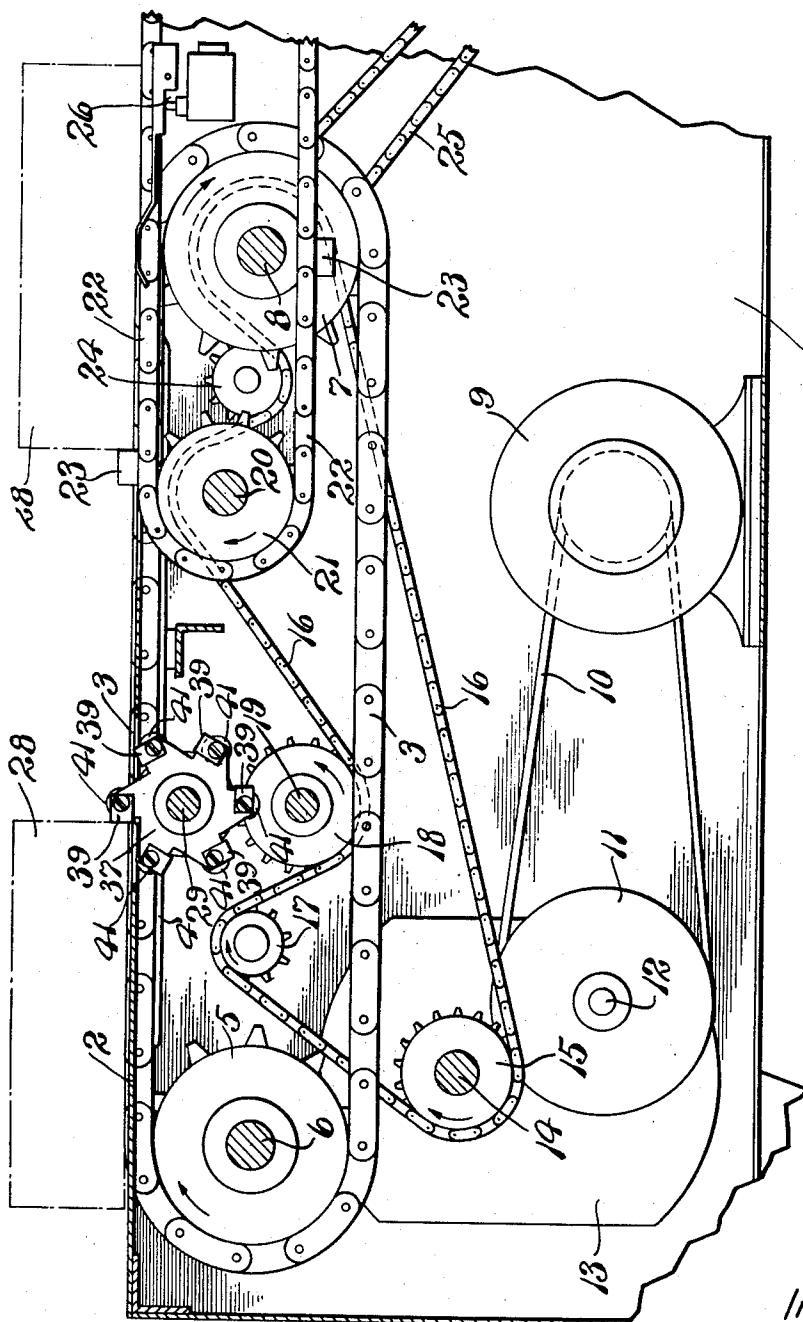
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3 Sheets-Sheet 2



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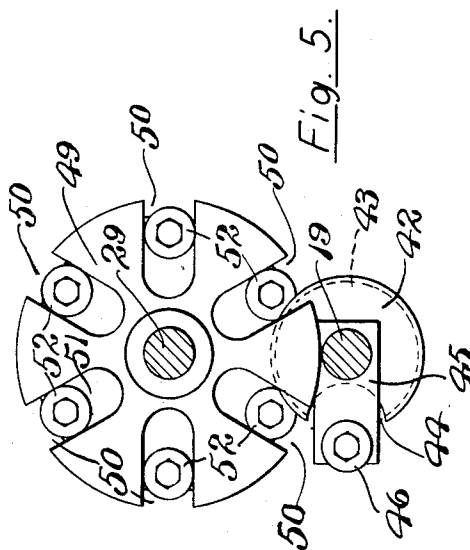
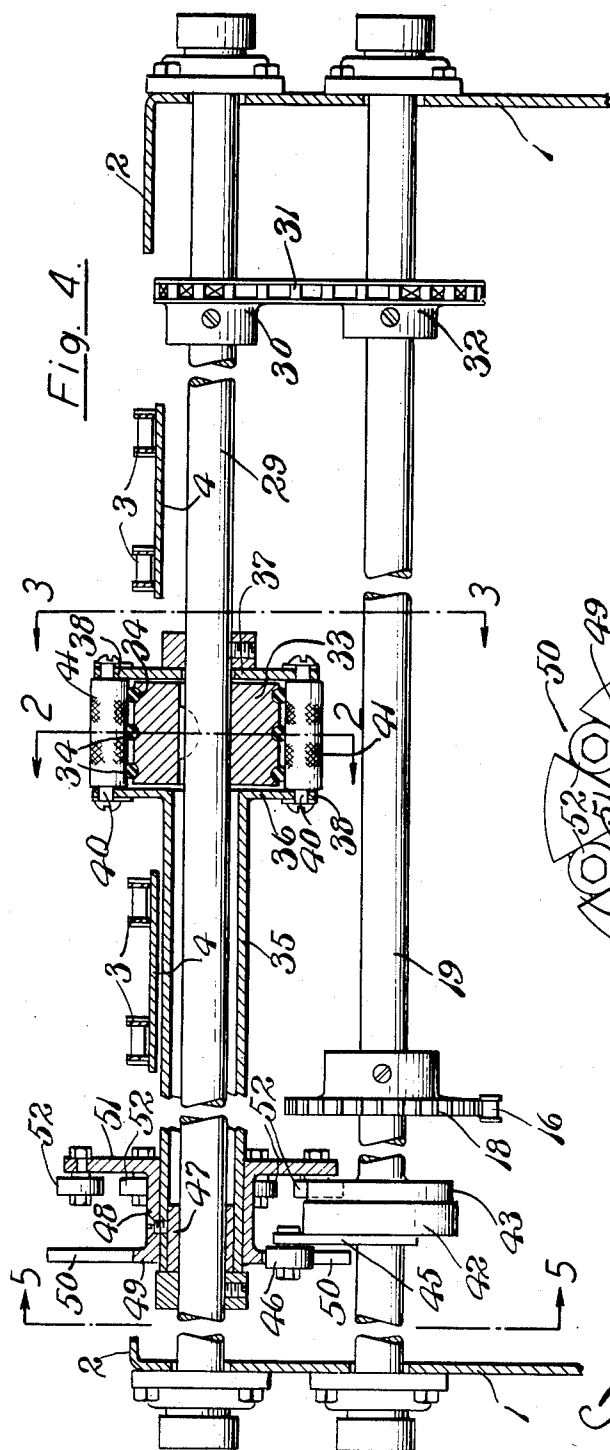
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3 Sheets-Sheet 3



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LABEL MACHINE FEEDING AND TIMING MECHANISM

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8 Claims. (Cl. 198—34)

This invention relates to a label machine feeding and timing mechanism. There is pending in the Patent Office, the application of Joseph L. Golubski, Serial No. 323,061, filed November 28, 1952, for Labeling Machine. In such machine the timing mechanism shown for the boxes or packages which are to be labeled is quite complicated in structure and with very light boxes or packages to be labeled is liable to be more or less uncertain in its operation because the movement of the boxes is controlled by moving conveyor chains, the weight of the boxes or packages resting upon the upper run of said chains; and where the boxes or packages are light the frictional contact thereof with the conveyor or carrying chains is slight so that undesired or accidental changes from desired positions of the boxes or packages as they are moved underneath the labeling unit may occur, with a liability of bad label application or other deficiencies in the attainment of the desired label attachment.

The present invention is directed to an improved feeding and timing mechanism for the labeling machine, in which by much simpler structure, a more practical and certain control of the feed of the boxes or packages to and underneath the label unit is obtained, reducing cost of manufacture and particularly insuring sturdiness and durability of structure and the certainty of right and long continued operation.

An understanding of the invention may be had from the following description taken in connection with the accompanying drawings, in which,

Fig. 1 is a side elevation of the labeling machine to which my invention is applied.

Fig. 2 is a fragmentary enlarged transverse vertical section on the plane of line 2—2 of Fig. 4.

Fig. 3 is a fragmentary longitudinal transverse vertical section through the labeling machine with my invention applied thereto, substantially on the plane of line 3—3 of Fig. 4.

Fig. 4 is a fragmentary enlarged transverse vertical section through the machine at the place of application of the present feeding and timing mechanism upon the plane of line 4—4 of Fig. 1, and

Fig. 5 is a transverse vertical section and end elevation, the view being taken from the plane of line 5—5 of Fig. 4.

Like reference characters refer to like parts in the different figures of the drawings, and the sectional views are taken looking in the directions of the arrows associated with the section lines.

With my invention the environment where it is used is a labeling machine which includes a fixed supporting structure having a generally horizontal somewhat elongated housing structure with spaced vertical sides 1 of flat metal, at the longitudinal upper edges of which is a horizontal top 2 which covers the mechanism within such supporting housing in general except where the top is longitudinally slotted for the movement of the upper runs of a number of conveyor chains 3, such upper runs

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passing over lower positioned horizontal plates 4. The chains 3 are of an endless link type and at their outer ends pass around sprocket wheels 5 on a horizontal cross shaft 6. The bearings carrying it are on the sides 1 of the supporting housing. The opposite ends of the chains pass around similar sprocket wheels 7 on a cross shaft 8. The upper sides of the links of the upper runs of such chains extend a short distance above the upper side of the top 2.

An electric motor 9 (Fig. 3), within the lower portion of the housing and toward its entrance end, drives an endless belt 10 which in turn passes around a driven pulley 11 on a shaft 12 entering a change speed gear housing 13 through which an output shaft 14 extends which is driven continuously and at a lower speed than the speed of the belt 10. Such shaft at its ends is carried by bearings mounted on the sides 1 of the supporting housing. A sprocket wheel 15 drives an endless chain 16. Such chain extends upwardly from wheel 15 to and over the upper side of an idler wheel 17, thence underneath a sprocket wheel 18 on a cross shaft 19, the bearings for which on the ends of the shaft are carried on the sides 1 of the housing (Fig. 4). Therefrom the chain 16 extends over and drives, through suitable sprocket wheel structure, a cross shaft 20 on which are the outer sprocket wheels 21 for a second series 22 of horizontal chains similar to the conveying chains 3, which as shown in Fig. 1, extend nearly to the delivery end of the machine and around similar sprocket wheels on a cross shaft 20a.

In the length of the chain 22 are a series of spaced blocks 23 which extend above the upper runs of the chains and below the lower runs thereof. Such chain 16 driving the shaft 20 thereupon goes underneath an idler 24 and upwardly over and around a suitable sprocket wheel on the shaft 8 so that the chains 3 are driven from sprocket wheels 7 on the shaft 8 and continuously move while the motor 9 is running. From the shaft 8 there is a chain 25 driven thereby for controlling the timing of the label affixing unit and immediately beyond the chains 3 is a tripping device 26 associated and used with the control of the labeling unit 27 which, as shown in Fig. 1, is located over the inner portion of the chains 3 and 22.

Such matter of the timing chains 25, the trip 26 and the labeling unit 27 are not parts of the present invention and need not be set forth in detail, being fully disclosed in essentials in the previously mentioned application.

Boxes or packages shown at 28 are carried by the upper runs of the chains 3 and delivered to the like runs of the chains 22 to be carried underneath the labeling unit 27, being pushed thereunder by the blocks 23 extending upwardly from the chains. The blocks 23 in spaced relation to each other come against the rear ends of the boxes or packages 28 insuring that such packages shall come properly to position underneath the labeling unit to receive the labels applied thereto.

The structure thus defined constitutes in the main the environment where my invention is used. The boxes or packages 28 delivered one after another to the upper runs of the initial chains 3 may come thereto located close together or spaced apart varying distances, there being no uniformity of spacing of the boxes and certainly no uniformity of spacing like between the blocks 23. With my present invention insurance is provided that however the boxes or packages may be delivered to the upper runs of the chains 3 they will be passed underneath the labeling unit in proper equally spaced intervals.

The novel structure by means of which such result is obtained includes a horizontal cross shaft 29 parallel to

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and directly over the shaft 19 on which a sprocket wheel 30 is driven by a chain 31 going around a wheel 32 on shaft 19, shafts 29 and 19 turning in unison. The shafts 19 and 29 are located in a vertical plane nearly midway between the shafts 6 and 20, that is, ahead of the second chains 22 and blocks 23 thereon and back of the front portions of the chains 3, such relative location being shown in Fig. 1. Substantially at mid length of the shaft 29 a cylindrical roller 33 is keyed. Such roller at its periphery has continuous spaced annular grooves in such of which an endless circular band 34 of resilient and, preferably, friction material is located, the bands being nearly circular in cross section.

An elongated sleeve 34 is located over one end portion of the shaft 29, at its outer end coming against a collar fixed to the shaft (Fig. 4) against which it bears. At its inner end the sleeve is flanged outwardly in a flange 36 which is closely adjacent but free from the roller 33. At the other end of the roller 33 a plate 37 is located, through which shaft 29 passes, being held by a collar fixed to the shaft 29 as in Fig. 4. Both the flange 36 and the plate or disk 37 have spaced and separated outwardly extending ears 38 which extend beyond the peripheral portions of the roller 33. The ears on the respective flange 36 and disk 37 are permanently secured together in pairs by stirrups 39 (Figs. 1 and 3) welded or otherwise securely connected therewith. A rod 40 extends through each pair of ears 38. On each of the rods a roller 41 is mounted for free rotation, extending beyond the outer edges of the ears and stirrups. Such rollers at their inner sides bear against the bands 34 and are driven continuously by reason of the bearing of the bands against the rollers whenever the shaft 29 is continuously driven. Because the diameters of the rollers 41 are appreciably less than that of the roller 33, the speed of rotation of rollers 41 is increased.

On shaft 19 (Fig. 4) a collar 42 is secured below and adjacent the outer end of the sleeve 35 which has a reduced diameter end portion 43 in a side of which a somewhat enlarged concave recess 44 (Fig. 5) is made. An arm 45 at one end fixed to collar 42 is mounted on the shaft 19 which extends therethrough, rotating with the shaft and at its outer end carries a laterally disposed roller 46.

Adjacent the outer end of the elongated sleeve 35 and over the part 42 a collar 47 is positioned through which shaft 29 passes, being between the shaft and the sleeve 35 but not connected with such sleeve. Likewise, above the part 42 is a sleeve 48 around the sleeve 35 and connected thereto which, at its outer end, has a radially extending flat disk portion 49 in which a plurality of spaced radial slots 50 are cut from the peripheral edges thereof inwardly as best shown in Fig. 5. The slots 50 are of a width such that the roller 46 may freely enter therein. At the opposite end of the sleeve 48 a radial disk flange 51 is integrally connected upon which a plurality of laterally located and spaced wheels 52 are mounted. The number of the wheels 52 corresponds to the number of the slots 50. Such wheels 52 bear in succession against the reduced diameter portion 43 of the member 42. Two of such wheels in succession come to and against such reduced portion 43.

The rotation of shaft 19 turns the arm 45 to carry the roller 46 in a circular path of movement and bring such roller to a slot 50 and, by a movement like a Geneva movement, turn the slotted disk 49 and sleeve 35 on which fixed one-sixth of a complete rotation, there being six of the slots 50. A roller 52 during such movement enters the recess 44, and at the end of the movement two of the rollers 52 bear against the reduced portion 43, as in Fig. 5, the rotor unit including sleeve 35 and parts attached therewith being held from movement, locking sleeve 48 and sleeve 35 connected therewith from moving under any impact of a box 28 or the like when moved to strike against a stirrup 39 disposed in the path of move-

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ment of said box 28, and thereby insuring a stopping of the box 28 against the stirrup 39 against which it strikes. With a continuity of the rotative movement of the shaft 19, the sleeve 35 and parts connected therewith move one-sixth of a revolution with each revolution of the shaft 29, with a pause between successive periodic movements of such sleeve 35. With each rotative movement of the shaft 35 a roller 41, of which there are six corresponding to the number of the slots 50, is lifted into position as in Fig. 3 above the upper sides of the links of the chains 3 and presents the stirrup 39 as a stop or obstruction to a box or package 28 coming thereto. This stops the movement of the boxes or packages 28 until such upwardly projecting stirrup 39 has been moved one-sixth of a revolution to a lower position which permits the box to move freely. The box or package which is to be labeled will then be carried by such chains 3 but will be simultaneously elevated by the next succeeding roller 41 moved to its uppermost position underneath the package 28 to be labeled. Such next succeeding roller 41 continuously rotating at high speed will act against the under side or bottom of the package 28 to continue its movement in the same direction of movement as the upper runs of the chains 3 until, as in Fig. 1, the box tilts downwardly and comes in contact with such chains and after leaving such uppermost roller 41 will be carried into position such that the next succeeding block 23 coming upwardly around sprocket wheel 21 will engage the rear end of such package 28 and move it under the label attaching unit.

With this structure, irrespective of how the boxes or packages 28 to be labeled are positioned with respect to each other ahead of a stirrup stop 19 which extends above the upper runs of chains 3, they will be properly spaced and timed for delivery one ahead of each of the blocks 23 as such blocks reach their upper operative positions.

This structure is of an exceptionally sturdy type or character and one which insures that whatever the weight of a package 28 which is to be labeled, it will be carried to and underneath the labeling unit at a proper position to receive the label which is to be applied. The rollers 41 are driving rollers engaging the bottoms of the packages 28 with a sufficient operative contact and pressure that the packages 28 which are to be labeled will move as soon as released by a stop 39 without faltering or accidental change of position with respect to the conveying chains 3 and 22 which move them to and underneath the labeling unit. Such invention eliminates any complex structure, reduces the number of parts needed and insures continuous operation without wear and break down, and further insures high speed of operation without operational difficulties.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a labeling machine having two aligned horizontal conveyors, one in front of the other and with adjacent ends overlapping and means to continuously drive said conveyors, the rear conveyor having spaced blocks in the length thereof extending outwardly, the improvement comprising, a horizontal shaft below the front conveyor back of the front end of the rear conveyor, a sleeve on said shaft, a flange at one end of the shaft, a disk spaced from said flange, both said flange and disk having spaced outwardly extending ears disposed in pairs, fixed means connecting the ears of each pair thereof, a roller mounted on and carried by and between each of said pairs of ears, a second roller on said shaft engaging and driving said first mentioned rollers, means for continuously driving said first shaft from the conveyor driving means, and means for turning said sleeve in periodic step by step movements, said first mentioned rollers being mounted in succession to an uppermost position above the front conveyor.

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2. In a labeling machine having two aligned horizontal endless conveyors, one in front of the other with adjacent ends of said conveyors overlapping, the rear conveyor having spaced outwardly extending package engaging means thereon, and means for continuously driving said conveyors, the improvement comprising, a rotative stop and feed means located between the ends of the front conveyor and below the upper run thereof including a horizontal shaft transverse to the length of said front conveyor, a roller on said shaft, plates at opposite sides of said roller, each having a plurality of spaced radial outwardly extending ears, providing pairs of ears, a plate connecting each pair of ears, a roller between each pair of ears engaged by said first roller and driven continuously thereby, and means for moving said plates and rollers carried thereby at equally spaced time intervals to successively move one of said last mentioned rollers and plates to a position above said front conveyor.

3. Structure as described comprising, a horizontal shaft, means for driving said shaft, a roller fixed to said shaft, a sleeve around one end portion of said shaft having an annular flange at one end at an end of said roller, a disk at the opposite end of said roller, said flange and disk each having a plurality of spaced, outwardly extending ears, disposed in pairs, a plate connection between the ears of each of said pairs, a roller mounted on and between the ears of each of said pairs of ears, driven continuously by said first roller, and means driven by said horizontal shaft connected with said sleeve to turn the sleeve in periodic step by step movements with time intervals between successive steps of movement to thereby bring the last mentioned rollers and ear connecting plates in succession to an uppermost position.

4. Structure as defined in claim 3, and yielding friction means around the first roller in pressure engagement with all of said second mentioned rollers.

5. In a labeling machine, a front and a rear horizontally positioned endless conveyor, said conveyors having adjacent end portions overlapping, and said rear conveyor having a plurality of spaced outwardly extending package engaging members in the length thereof, a rotor mounted to turn on a horizontal axis transverse to the length of and between the ends of the front conveyor, said rotor comprising two spaced plates, each having a plurality of spaced outwardly extending radial ears, stop plates connecting opposed ears on said plates in pairs, and a roller mounted on each of said

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pairs of ears extending between associated ears of said pairs, means for continuously driving said rollers, and means for periodically turning said rotor through an arc of movement equal to 360 degrees divided by the number of rollers, thereby successively bringing said rollers, one after another, into an upper position above the front conveyor.

6. Structure as defined in claim 5, said ears, connecting stop plates and rollers having location with respect to each other and said front conveyor that in said upper position, a plate is in front of its associated roller, the upper portion of said roller above the upper edge of said plate, and the roller, plate and upper portions of said ears are above the said front conveyor.

7. In a labeling machine, aligned front and rear horizontal endless conveyors having adjacent end portions overlapping, and said rear conveyor having spaced outwardly extending package engaging members in the length thereof, means for continuously driving said conveyors, a rotor mounted to turn on a horizontal axis transverse to the length of and between the ends of the front conveyor, said rotor having a plurality of radial, outwardly extending members therearound movable in succession one after another above the front conveyor, and in such position providing a stop against movement of an article coming thereto carried by said front conveyor, a roller carried by each of said members extending beyond the outer ends of associated members, means for continuously driving said rollers, and means for periodically turning said rotor in step by step movements through successive arcs of a circle each equal to 360 degrees divided by the number of radial members on said rotor.

8. Structure as defined in claim 7, said means for turning said rotor comprising a driving shaft, a disk having a plurality of equally spaced radial slots extending inwardly from the peripheral edges thereof connected with said rotor, an arm secured to and extending radially from the driving shaft, a roller on said arm adapted to enter one of said slots with each rotation of the driving shaft and means for driving said driving shaft from the means which continuously drives said conveyors.

References Cited in the file of this patent

UNITED STATES PATENTS

2,731,130 Blickenderfer Jan. 17, 1956