

March 2, 1971

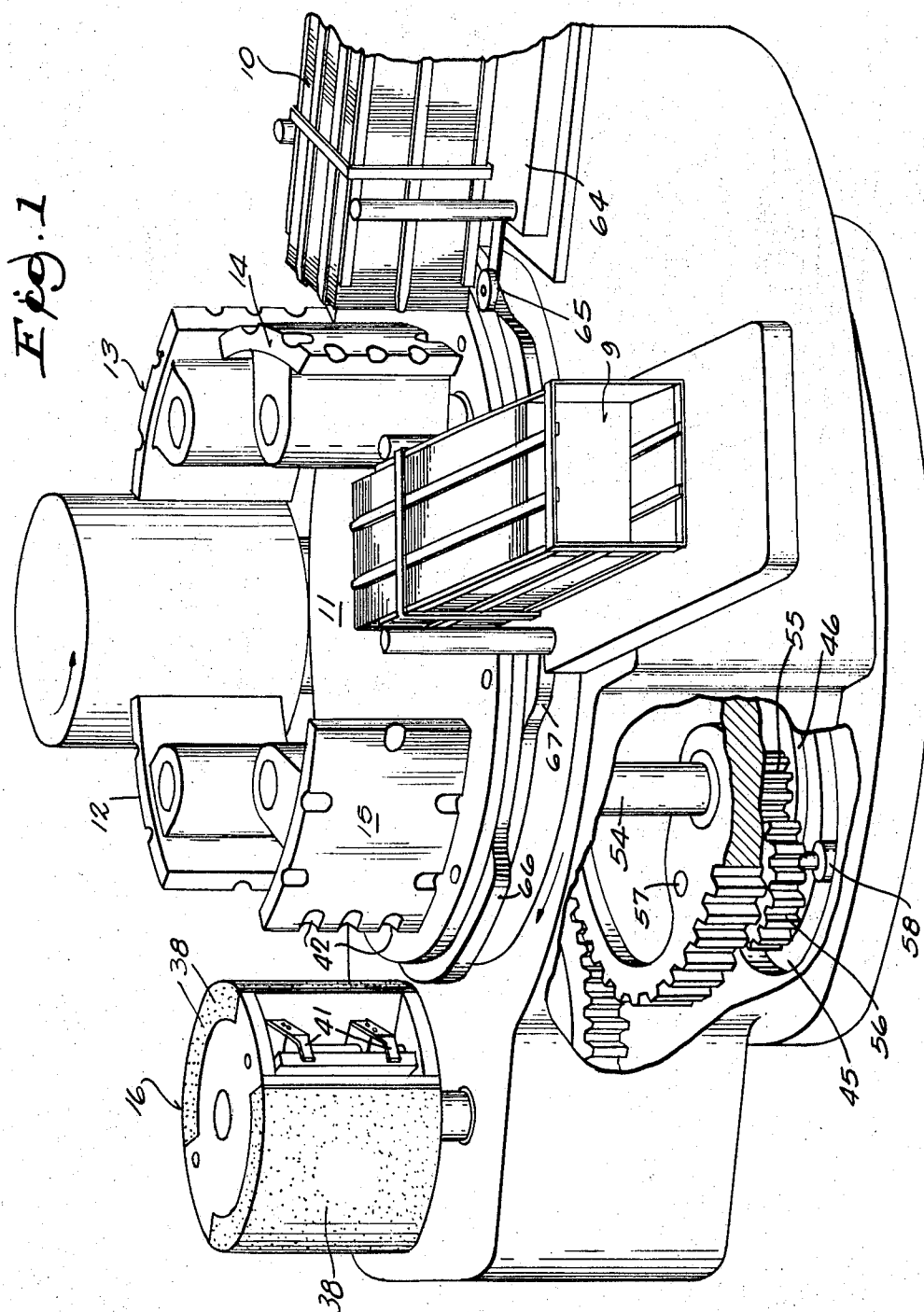
K. DULLINGER

3,567,559

HIGH SPEED CONTAINER LABELING MACHINE

Filed July 18, 1968

4 Sheets-Sheet 1



INVENTOR
KARL DULLINGER

BY *Wheeler, Wheeler, House & Clemency*
ATTORNEYS

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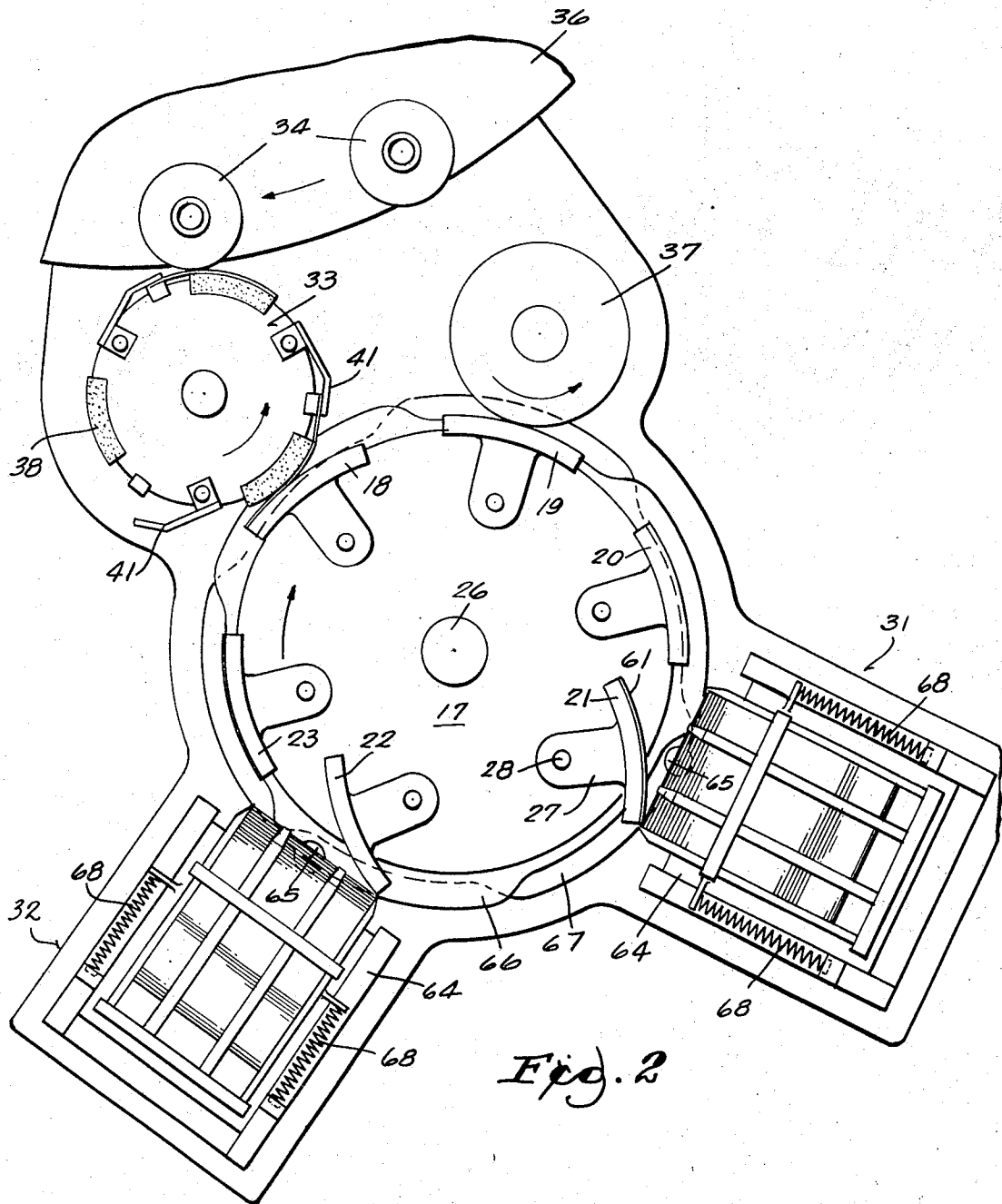
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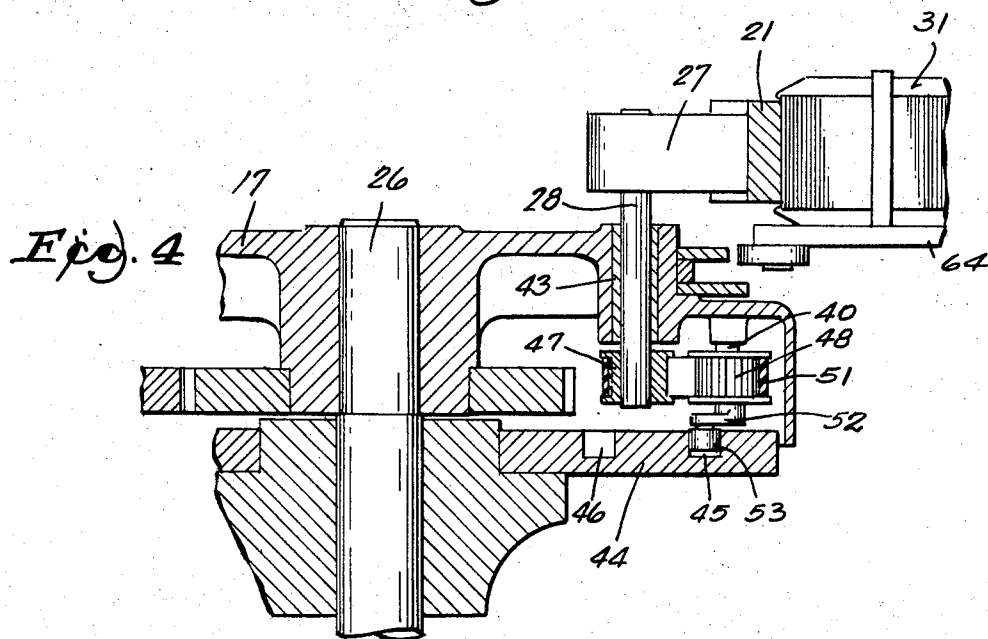
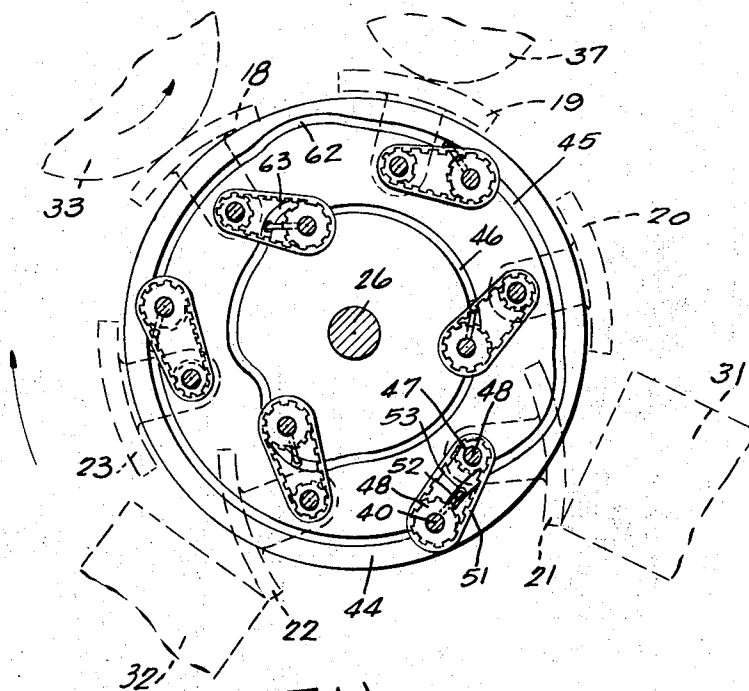
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4 Sheets-Sheet 3



INVENTOR
KARL DULLINGER

BY *Wheeler, Wheeler, Howe & Clemency*
ATTORNEYS

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4 Sheets-Sheet 4

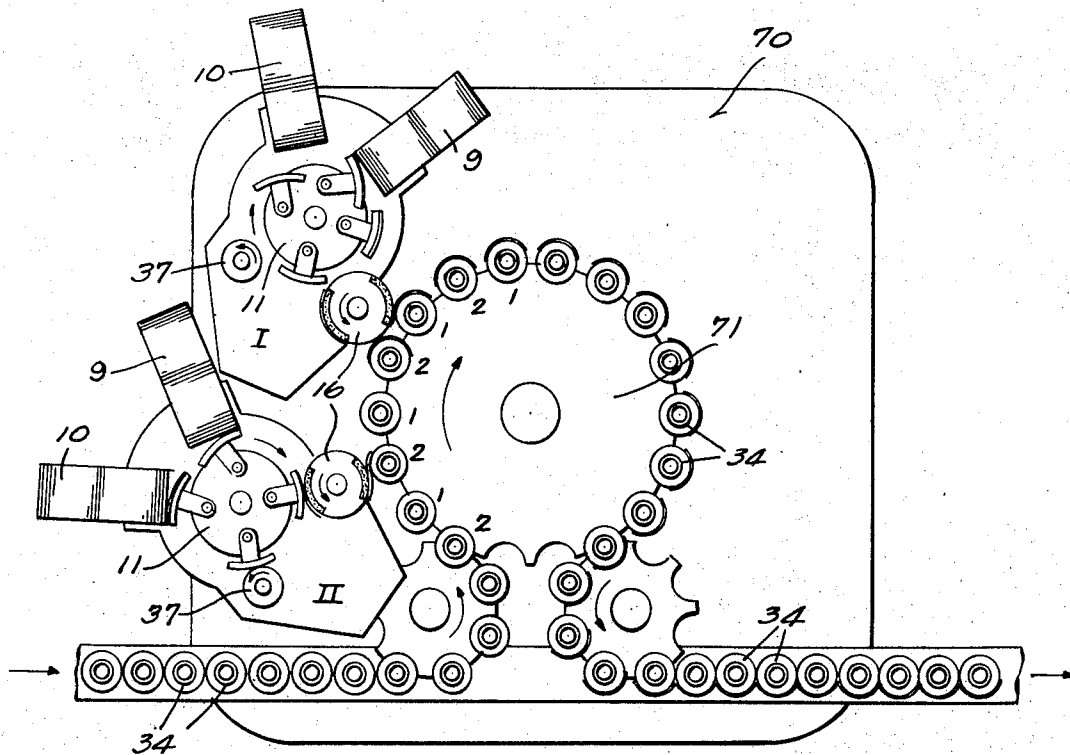


Fig. 5

INVENTOR
KARL DULLINGER

BY *Wheeler, Wheeler, Howe & Clemency*
ATTORNEYS

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3,567,559
HIGH SPEED CONTAINER LABELING MACHINE
Karl Dullinger, Neutraubling, Germany, assignor to
Hermann Kronseder, Neutraubling, Germany
Filed July 18, 1968, Ser. No. 745,778
Claims priority, application Germany, Aug. 17, 1967,
K 63,114
Int. Cl. B65h 3/08; B32b 31/20
U.S. Cl. 156—571

9 Claims

ABSTRACT OF THE DISCLOSURE

A high speed container labeling machine and apparatus to transfer labels from separate label magazines to a rotating label turret which applies the labels to the containers and in which multiple label magazines are disposed about the axis of an adhesive pad rotor which carries multiple groups of oscillatable adhesive pads disposed about the rotor axis, some of the pads constituting a pad group associated with one of the magazines and others of the pads constituting another pad group associated with another of said magazines, and means for oscillating said pads for coaction of each pad group with its associated label magazine.

BACKGROUND OF THE INVENTION

French Pat. 1,471,570 shows apparatus to transfer labels from a stationary label magazine to a rotating label turret. French Pat. 1,492,697 shows a similar machine, but in which there are two label magazines and two adhesion pad rotors, each carrying separate sets of pads which alternately pick labels from the magazines and transfer them to a common labeling turret. The turret then applies the labels to the containers.

SUMMARY OF THE INVENTION

The present invention improves on the prior art in that all of the adhesion pads are located on the same pad rotor and about the same axis of rotation. The label magazines are also disposed about the axis of the adhesion pad rotor. The pads on the rotor are arranged in groups each associated with one of the magazines. Means are provided for oscillating the pads for coaction of each pad group with its associated label magazine.

In accordance with the present invention, increased speed of labeling machine operation is achieved. Moreover, less space is required than in the machine of French Pat. 1,492,697, notwithstanding an increase in machine speed.

Other objects, features, and advantages of the invention will appear from the following disclosure.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one form of apparatus embodying the invention.

FIG. 2 is a plan view of a different embodiment of such apparatus.

FIG. 3 is a fragmentary view similar to FIG. 2, but showing the cam tracks and oscillating means by which the adhesion pads are oscillated.

FIG. 4 is a vertical cross section taken through the machine and showing the oscillatory mounting of one of the adhesion pads.

FIG. 5 is a plan view illustrating two of the pad transfer devices embodying the present invention incorporated in a labeling machine.

PREFERRED EMBODIMENTS OF THE INVENTION

Although the disclosure hereof is detailed and exact to

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enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structure. The scope of the invention is defined in the claims appended hereto.

In addition to the French patents above listed, cross reference is also made to certain copending United States patent applications, as follows:

(a) Application Ser. No. 694,617, filed Jan. 2, 1968, entitled "Oscillating Label Transfer Drum."

(b) Application Ser. No. 663,289, filed Aug. 25, 1967, entitled "Automatic Label Wrapper."

FIG. 1 of the instant application shows an embodiment of the invention in which there are two stationary label magazines 9, 10 adjacent to a rotor 11 upon which four oscillatory adhesion pads 12, 13, 14, 15 are mounted. Adjacent the rotor 11 there is a label transfer turret 16.

The embodiment of FIG. 2 has the same over-all arrangement except that in this embodiment the rotor 17 carries six oscillatory adhesion pads 18, 19, 20, 21, 22, 23. Each pad 18-23, inclusive, has a curved face concentric to the axis of shaft 26 about which the rotor 17 turns. Each pad is mounted on an arm 27, and each arm 27 is mounted on a shaft 28, the oscillatory movement of which is powered as shown in FIGS. 3 and 4.

As in the FIG. 1 embodiment, the label magazines 31, 32 of FIG. 2 are disposed about the axis of shaft 26 of rotor 17. All label magazines in the present disclosure are "stationary" in the sense that they do not have any movement in the direction of rotation of the rotor. They do, however, have reciprocating motion toward and away from the axis of rotation of the rotor, as will hereinafter be explained.

In the FIG. 2 construction there is also a turret 33 to which the adhesion pads transfer labels. Turret 33 of FIG. 2 is comparable to turret 16 of FIG. 1. Turret 33 applies the labels to containers, such as bottles 34 on the bottle feeding mechanism 36. Also adjacent the path of rotor 17 is a glue applying roller 37.

Details of the label applying turrets 16, 33 are shown in the above identified copending applications Ser. No. 663,289. These turrets typically have yieldable pads 38 spaced arcuately along the periphery of the turret. Between the pads there are gripper fingers 41 which are actuated to reach into grooves 42 in the leading edges of the adhesion pads to pick labels off of the pads and transfer the labels from the pads to the turrets 16, 33. In the FIG. 1 embodiment, four such yieldable pads 38 are shown. In the FIG. 2 embodiment, three such yieldable pads 38 are shown, inasmuch as there are six of the adhesion pads in the FIG. 2 embodiment.

An important feature of the present invention is the transfer of labels from each of the magazines to the label applying turret in separate series. The adhesion pads 18-23, inclusive, of FIG. 2 are arranged in multiple groups, each group being associated with one of the magazines. Adhesion pads 19, 21, 23 constitute one pad group associated with label magazine 31. Adhesion pads 18, 20, 22 constitute another pad group associated with the label magazine 32. All the pads and the label magazines for both groups, however, are arranged around the common axis 26 of the rotor 17.

Accordingly, adhesion pads 18, 20 and 22 will take labels only from label magazine 32. Adhesion pads 19, 21 and 23 will take labels only from label magazine 31. Means are provided for oscillating the adhesion pads about their respective shafts 28 in timed relationship to the proximity of the pads to the respective magazines 31, 32, the label applying turret 33 and the glue roller 37. This means is shown in FIGS. 3 and 4, for the embodiment of FIG. 2.

In FIG. 4, adhesion pad 21 is shown in the same approximate position with respect to label magazine 31 which it occupies in FIGS. 2 and 3. The arm 27 for the pad 21 is fixed to the shaft 28 which is rotatable in bearing 43 on the rotor 17. Beneath the rotor 17 there is a fixed cam track plate 44 in which two cam tracks 45, 46 are formed. Outside cam track 45 governs the oscillatory movements of the pad group 19, 21, 23. Inside cam track 46 controls the oscillatory movements of the pad group 18, 20, 22.

Various forms of motion transmitting connections are utilized in rotating the shafts 28. In the embodiment of FIGS. 2, 3 and 4, the lower end of each shaft 28 is provided with a cog pulley 47. Also mounted on the rotor 17 on shaft 40, at a slight spacing from cog pulley 47, is another cog pulley 48 which may typically have a larger diameter than cog pulley 47. The two pulleys are connected by cog belt 51. This constitutes a motion multiplying transmission between the shafts 40 and 28.

Fixed to the bottom of shaft 40 for cog pulley 48 is a crank arm 52 from which a cam follower roller 53 depends. This roller follows track 45. The same arrangement is provided on the shafts 28 of the inside pad group 18, 20, 22. Accordingly, each group of adhesion pads is actuated separately in response to the contour of its own cam track.

In FIG. 1 a slightly different specific arrangement is illustrated. In this embodiment the shaft 54 for the adhesion pad 15 has on its lowermost end a pinion 55 which meshes with the teeth of a larger gear 56 which is journaled for rotation on shaft 57. On an axis offset from shaft 57 gear 56 carries a cam track roller 58 which follows a cam track such as 45.

The contour or profile of the respective cam tracks 45, 46 is such that as each pad in both groups passes the glue roller 37, the outer face of the pad 19 will be concentric to the rotor axis 26. Accordingly, a coating of glue will be transferred from the roller 37 to the outer face of the pad.

As the pads 18, 20, 22 of one pad group approach label magazine 32, inside cam track 46 will oscillate the pads to the position shown by pad 22 in FIGS. 2 and 3. As rotor 17 continues rotation, the cam track 46 will counter-oscillate the pad in the opposite direction to the direction of rotation of the rotor 17. Accordingly, the pad "walks" along the foremost label in the magazine 32, thus to pick up the label onto the pad, as is described in the above identified French patents. The same procedure is effective for the other group of adhesion pads 19, 21, 23. Pad 21 is shown just as it leaves magazine 31 and has picked up the foremost label 61 therefrom.

As all of the pads orbit past the turret 33, they will be disposed in such a position as to coact with the fingers 41 and yieldable pads 38 to transfer the label to the turret 33.

In order to still further increase the capacity of the machine operation, it is another feature of the present invention that turret 33 will rotate at a somewhat greater speed than the speed of rotation of the rotor 17. To match this speed as the label is transferred from the pads 18-23 to the turret 33, the respective cam tracks 45, 46 are provided with a motion accelerated lobe. Cam track 45 has lobe 62, and cam track 46 has lobe 63. These lobes will cause the pad which is opposite the turret 33 to oscillate in the forward direction, thus to cause a transient increase in pad speed and match the speed of the pad to the speed of the turret 33. The yieldable pads 38 on the turret are sufficiently yieldable to accommodate for the change in radial position of the pad face during the course of this oscillation.

Both of the label magazines 31, 32 are provided with mechanism for their radial advancement and retraction, depending upon the proximity of the various pads thereto, to spacially relate the pad groups with the label magazines to insure coaction of each pad group with its asso-

ciated label magazine and preclude coaction of each pad group with the label magazine associated with the other pad group. For this purpose the magazines are mounted on slideways 64 biased by the springs 68 toward the rotor axis 26. These slideways 64 are provided with cam follower rollers 65 which respectively coact with peripheral cams 66, 67 formed on the edges of the rotor 17. The cam configuration is such that when any one of the group of adhesion pads 19, 21, 23 is opposite label magazine 31, cam 66 allows the label magazine 31 to be biased by its springs 68 toward the pad so that its foremost label 61 will be effectively transferred to the pad. During this transfer the springs maintain yielding pressure of the label magazine against the pad and permit radial movement of the pad and the magazine in accordance with the oscillation of the pad.

However, after a pad in this group has passed the label magazine 31, the contour of cam 66 is such as to push the magazine 31 to its retracted position out of range of the pads in pad group 18, 20, 22 which will now be held by cam track 46 with their outer faces concentric to the rotor axis 26. Accordingly, these pads 18, 20, 22 will pass in spaced relation to the foremost label in label magazine 31. However, when these pads 18, 20, 22 reach the label magazine 32, its cam 67 is contoured to permit it to be moved forward under the influence of its springs 68, thus to coact with such pads for transfer of labels from magazine 32 to the pads.

FIG. 5 shows a labeling machine 70 which incorporates two sets of label transfer mechanisms I and II, each one of which constitutes a label transfer mechanism such as is shown in FIG. 1 or FIG. 2 herein. For exemplification, FIG. 5 shows label transfer mechanisms similar to that shown in FIG. 1 in which there are four adhesion pads on each rotor 11.

Containers such as the bottles 34 are fed to the machine in a conventional manner and are conveyed on the rotary turn table or conveyor 71 to pass the respective label applying turrets 16 of the label transfer mechanisms I and II. The timing is such that alternate bottles 34 are treated respectively by the mechanisms I and II. Accordingly, each mechanism I and II need operate only one half as fast as would otherwise be required.

The bottles 34 in the turn table 71 are respectively labeled 1, 2, 1, 2, etc., to indicate those labeled respectively by the label transfer mechanisms I, II, I, II, etc.

What is claimed is:

1. In a high speed container labeling machine, apparatus to transfer labels in multiple series from separate label magazines to a rotating label turret which applies the labels to the containers, said apparatus comprising an adhesion pad rotor, multiple label magazines, one for each of said series, oscillatable adhesion pads swingably mounted on said rotor and disposed about its axis of rotation, a plurality of said pads constituting a pad group associated with one of said magazines and a different plurality of said pads constituting another pad group associated with another of said magazines, means for oscillating said pads for coaction of each pad group with its associated label magazine, and means to spacially relate the pad groups with the label magazines to insure coaction of each pad group with its associated label magazine and preclude coaction of each pad group with a label magazine associated with another pad group.

2. The machine of claim 1 in which there is a glue roller adjacent said rotor and means for passing all said pads in all groups into glue transfer relation to said roller.

3. The machine of claim 1 in combination with means for increasing the speed of movement of each pad as it transfers its label to said labeling turret.

4. The machine of claim 1 in which said magazines are mounted for substantially radial movement toward and away from the axis of rotor rotation, the last mentioned means comprising means for retracting said magazines

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from the path of pads in the pad group associated with another magazine.

5. In a high speed container labeling machine, apparatus to transfer labels in multiple series from separate label magazines to a rotating label turret which applies the labels to the containers, said apparatus comprising an adhesion pad rotor, multiple label magazines, one for each of said series, oscillatable adhesion pads swingably mounted on said rotor and disposed about its axis of rotation, some of said pads constituting a pad group associated with one of said magazines and others of said pads constituting another pad group associated with another of said magazines, and means for oscillating said pads for coaction of each pad group with its associated label magazine, said magazines being mounted for substantially radial movement toward and away from the axis of rotor rotation, and means for retracting said magazines from the path of pads in the pad group associated with another magazine, the last mentioned means comprising a cam on said rotor for each magazine and a cam follower on each magazine for following its respective cam.

6. In a high speed container labeling machine, apparatus to transfer labels in multiple series from separate label magazines to a rotating label turret which applies the labels to the containers, said apparatus comprising an adhesion pad rotor, multiple label magazines, one for each of said series, oscillatable adhesion pads swingably mounted on said rotor and disposed about its axis of rotation, some of said pads constituting a pad group associated with one of said magazines and others of said pads con-

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stituting another pad group associated with another of said magazines, and means for oscillating said pads for coaction of each pad group with its associated label magazine, said means comprising a fixed track adjacent said rotor for each pad group, the pads in said group having oscillatory means with cam followers which follow said cam track.

7. The machine of claim 6 in which said oscillatory means comprises motion multiplying means.

8. The labeling machine of claim 5 in which there are two of said apparatus, both arranged about a bottle conveyor, each said apparatus applying labels to alternate containers on said conveyor.

9. The machine of claim 8 in combination with means for increasing the speed of movement of each pad as it transfers its label to said labeling turret.

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SAMUEL FEINBERG, Primary Examiner

J. M. HANLEY, Assistant Examiner

U.S. Cl. X.R.

156—212, 481; 271—29