United States Patent

[11] 3,591,168

[72] Inventor **Rudolf Zodrow**
Dusseldorf, Germany

[21] Appl. No. **733,376**
[22] Filed **May 31, 1968**
[45] Patented **July 6, 1971**
[73] Assignee **Jagenberg-Werke AG**
Dusseldorf, Germany
[32] Priority **July 17, 1967**
[33] **Germany**
[31] **J 29 010**

[54] **APPARATUS FOR LABELING BOTTLES AND SIMILAR ARTICLES**
3 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **271/36,** 156/568, 156/571, 271/33
[51] **Int. Cl.** **B65h 3/06,** B65c 9/08
[50] **Field of Search** 271/36, 37, 33; 156/571, 568

[56] **References Cited**
UNITED STATES PATENTS

2,703,660	3/1955	Von Hofe et al.	156/571
2,764,408	9/1956	Weiler	156/568
2,717,711	9/1955	Banks	156/571
2,449,298	9/1948	Hoppe	156/568
3,450,591	6/1969	Zodrow	156/571

Primary Examiner—Evon C. Blunk
Assistant Examiner—H. S. Lane
Attorney—Burgess, Dinklage & Sprung

ABSTRACT: Apparatus for labeling bottles and similar articles including a revolving carrier having a plurality of label withdrawing segments arranged in a circular series and mounted for controlled swinging movement into and out of a path of uniform rotation at a label withdrawal station adjacent a stationary label magazine to successively withdraw the end label from a stack of labels in the magazine by a rolloff action and carry such labels toward a label applying station.

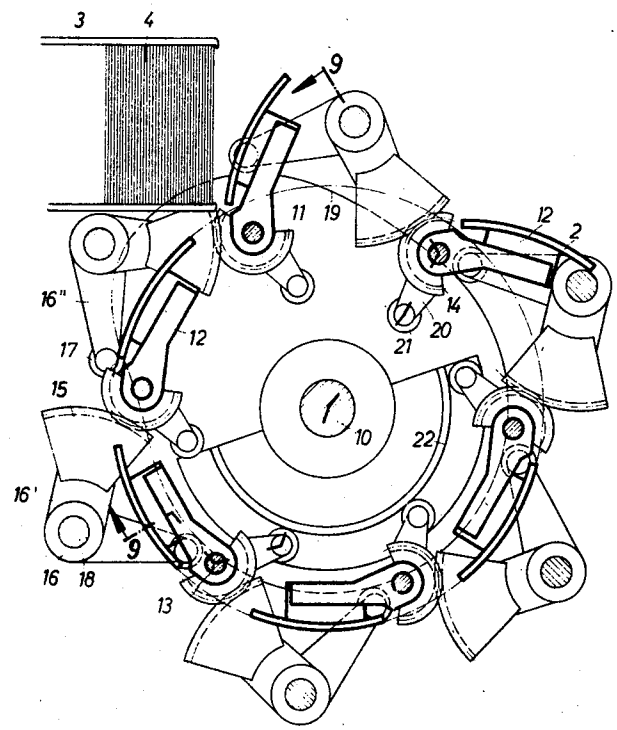


Fig.1

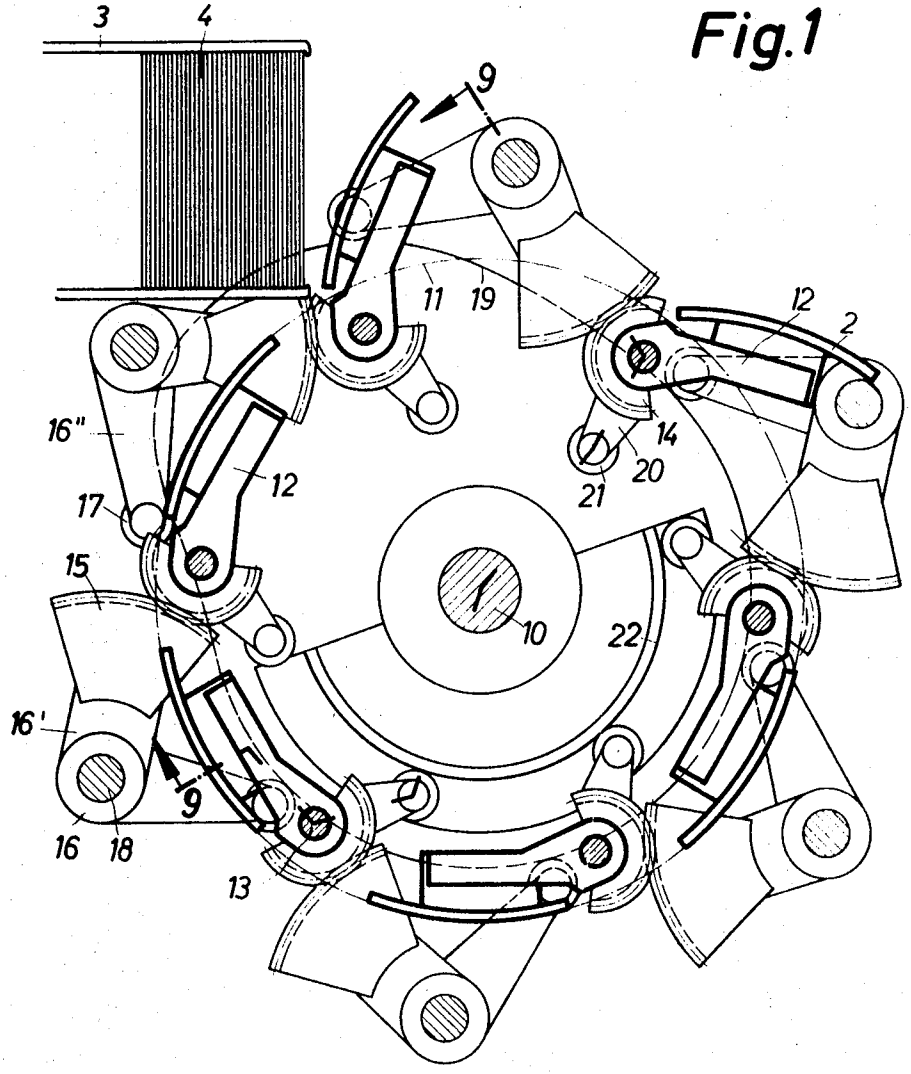


Fig. 2

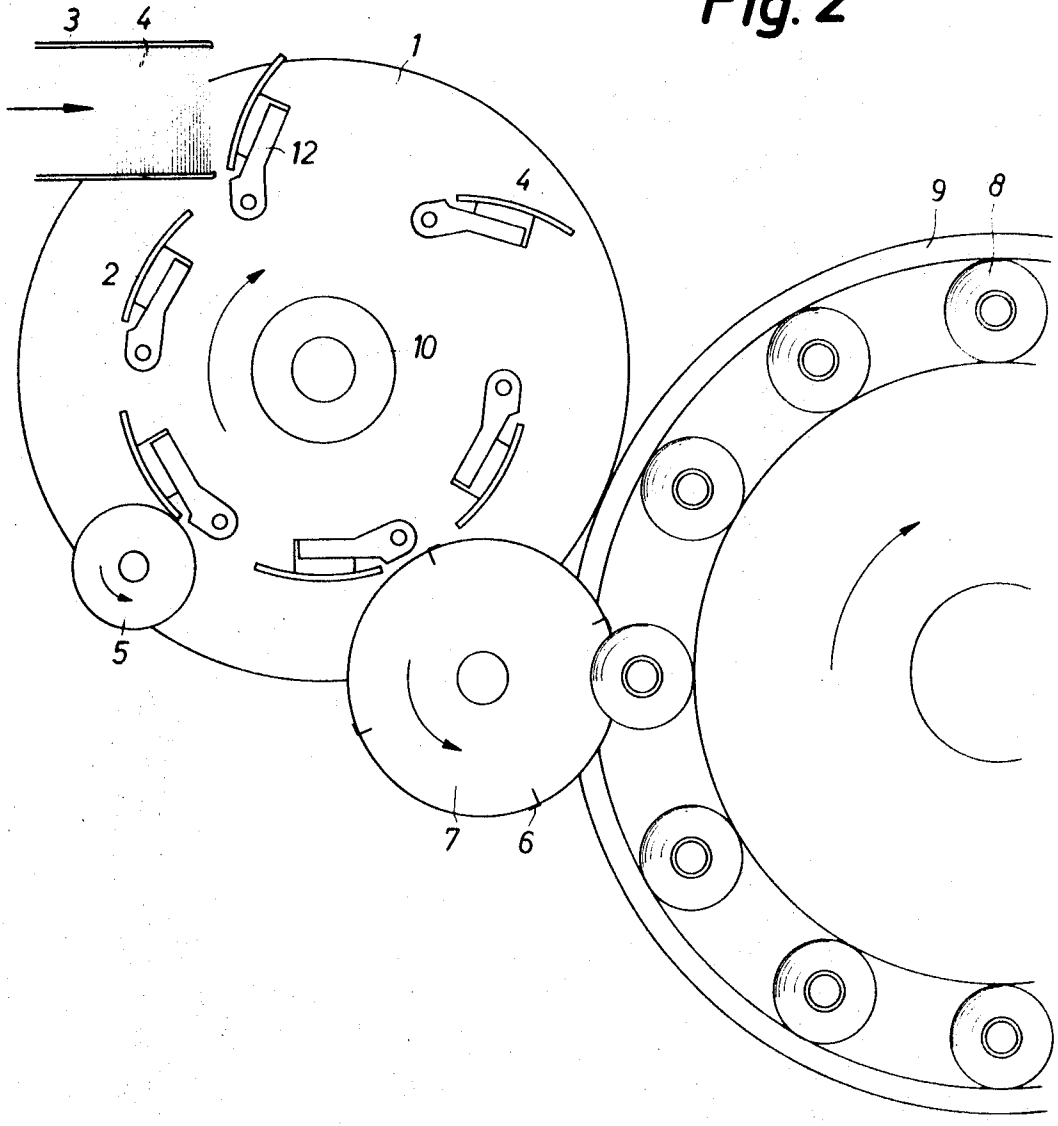


Fig.3

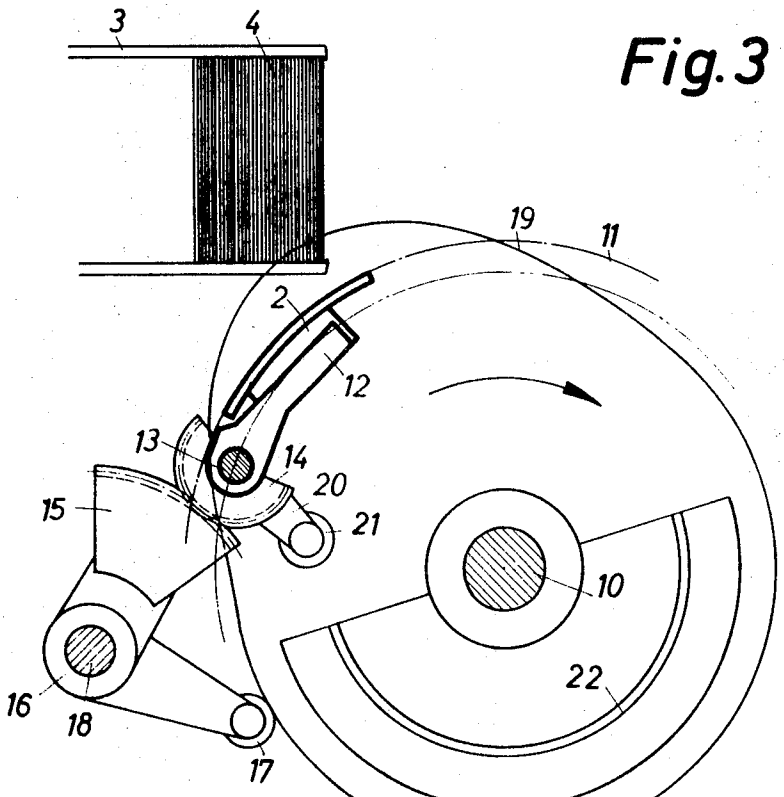
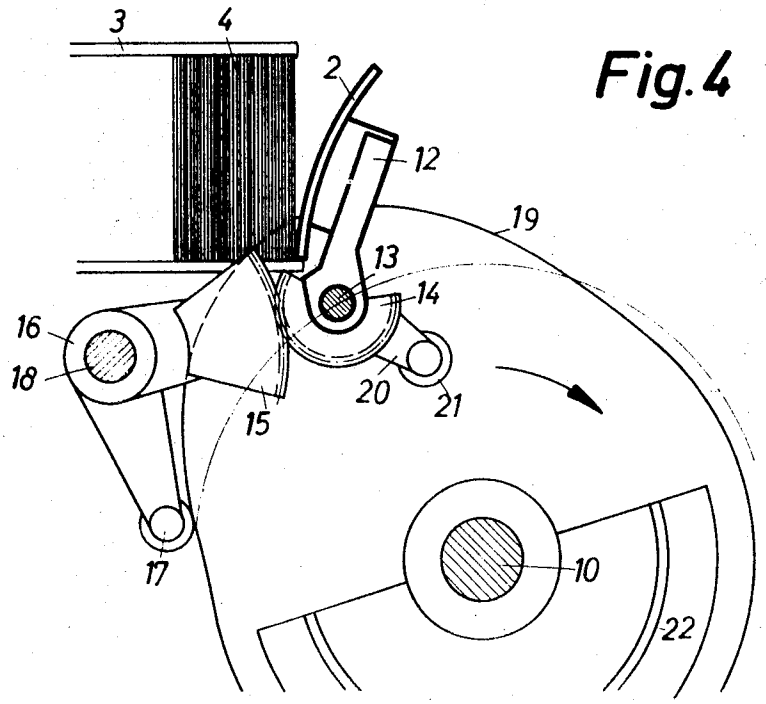

3
4
19
11
2
12
13
14
20
21
15
10
22
16
18
17

Fig.4


3
4
2
12
19
13
14
16
18
20
21
15
17
10
22

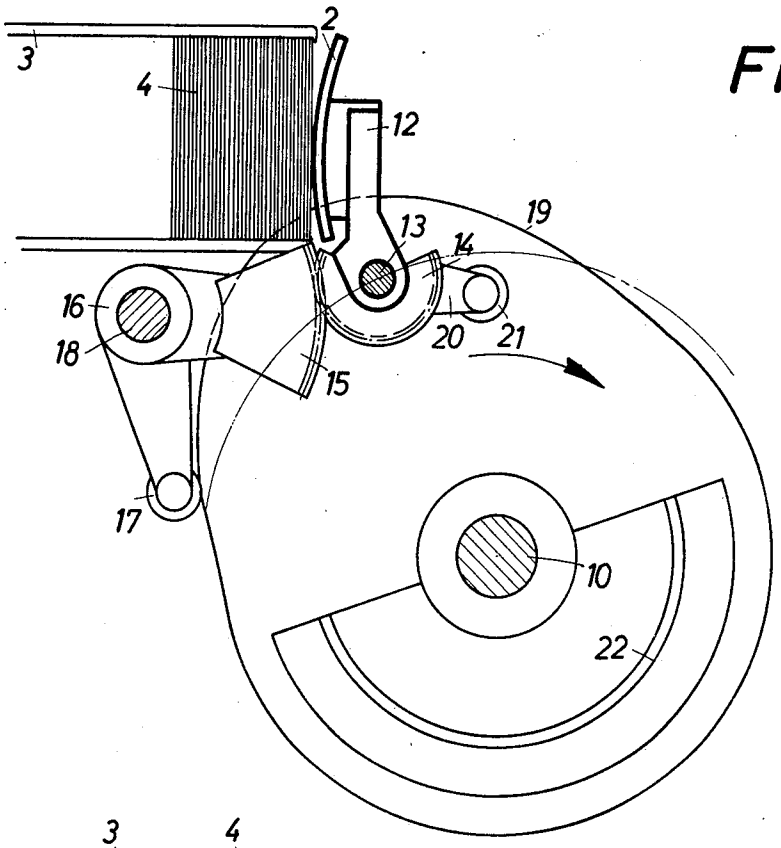

2
3
4
12
19
13
14
16
18
20
21
15
17
10
22

Fig. 5

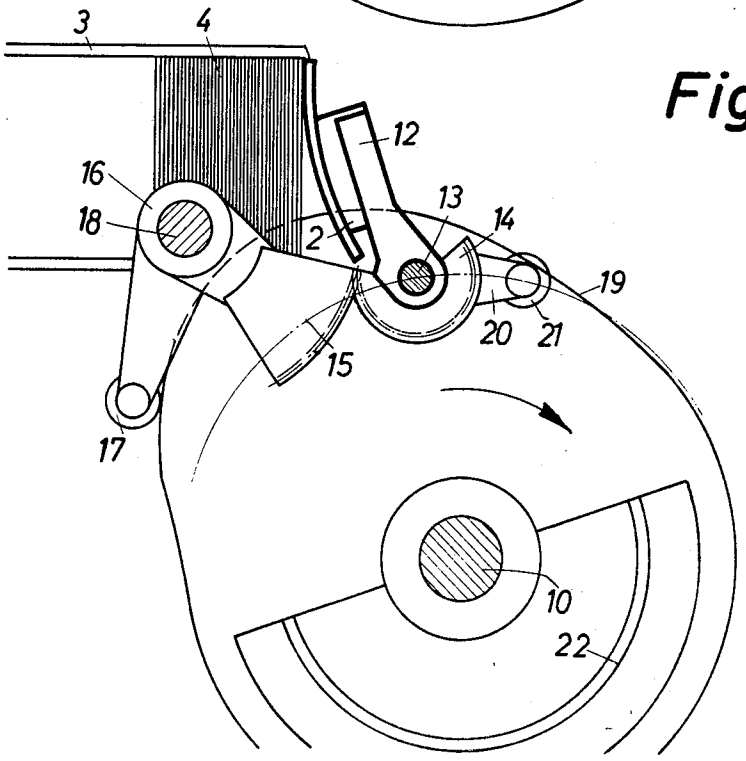

3
4
12
16
18
13
14
2
19
20
21
15
17
10
22

Fig. 6

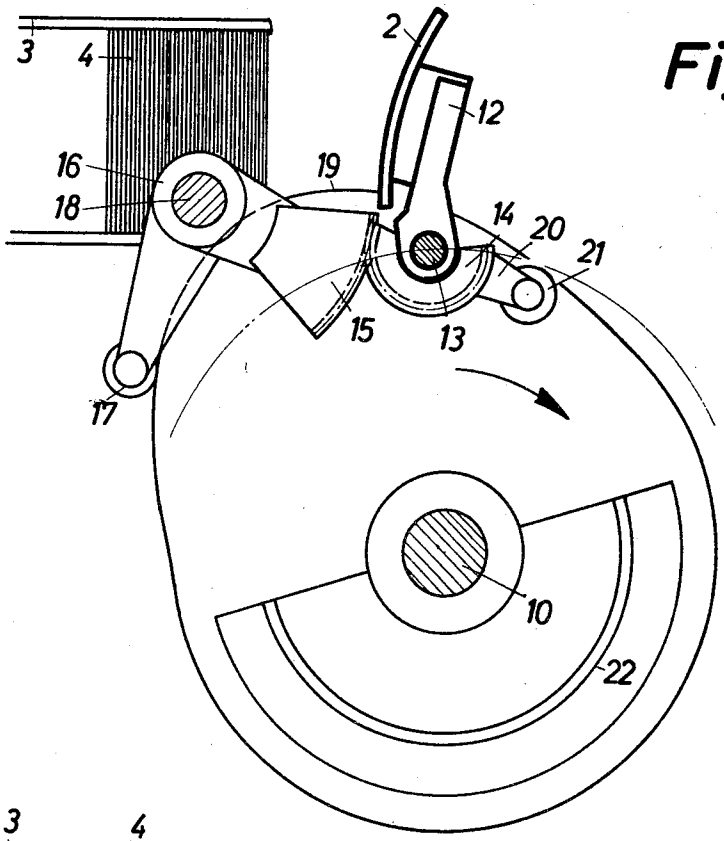

3
4
2
12
16
18
19
14
20
21
15
13
17
10
22

Fig.7

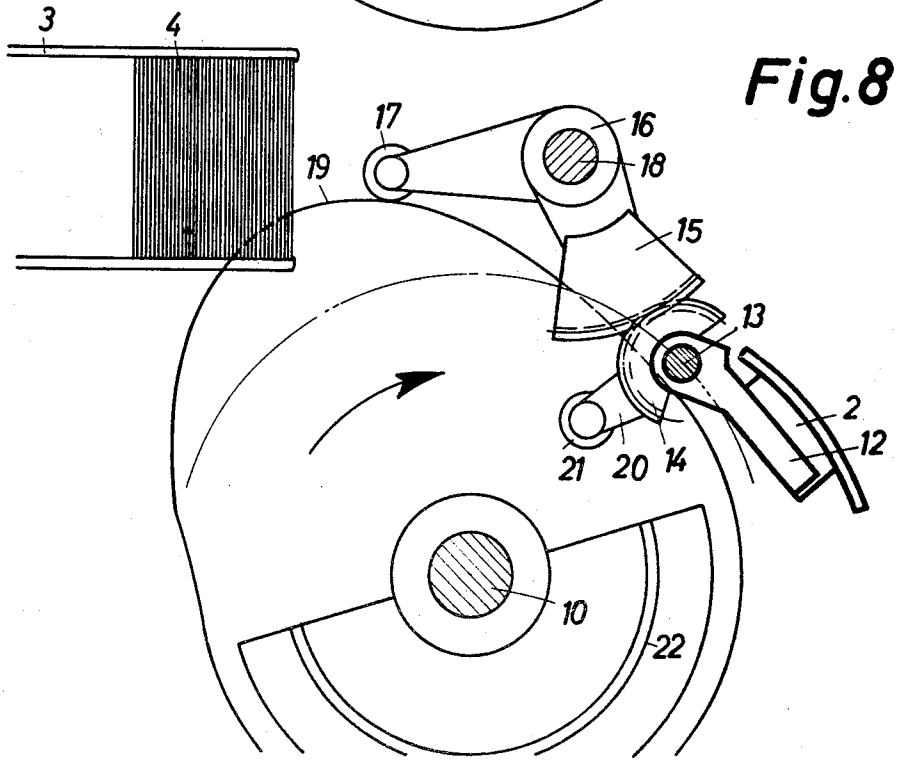
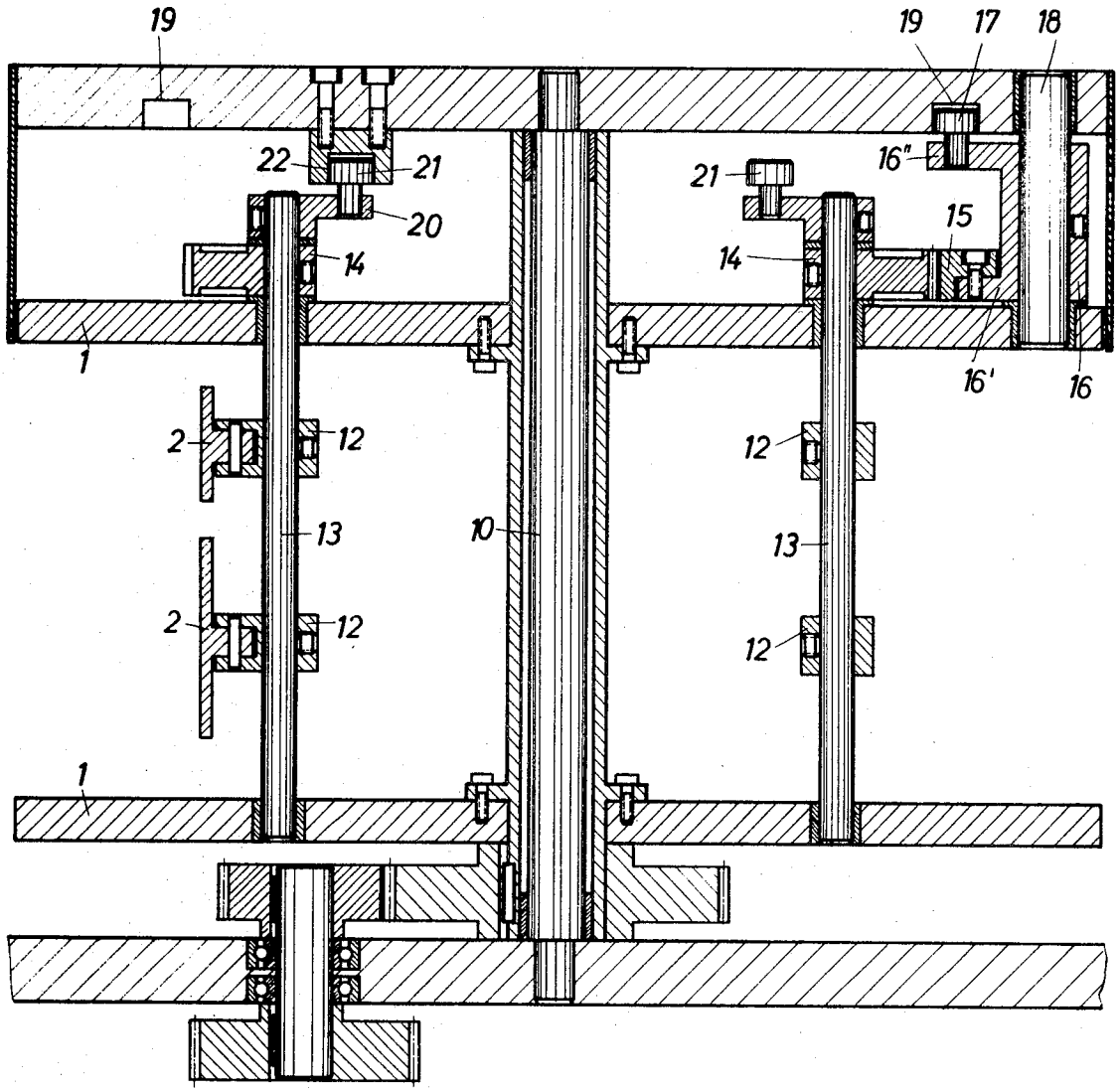

3
4
17
16
18
19
15
13
2
12
21
20
14
10
22

Fig.8

Fig. 9



APPARATUS FOR LABELING BOTTLES AND SIMILAR ARTICLES

The present invention relates broadly to the art of bonding one article to another.

More particularly this invention relates to apparatus for applying labels to bottles or similar articles and which apparatus is of the type in which labels are successively withdrawn from a stationary magazine or stack by means of segmentally shaped members that are rotatably mounted on a revolving support and in which after withdrawal the labels are successively conveyed to successive articles to be labeled.

This invention further relates to label applying apparatus of the general type exemplified in my prior U.S. Pat. Application Ser. No. 572,411 filed Aug. 15, 1966, now U.S. Pat. No. 3,450,591. In such application the apparatus components are so arranged that a revolving support carrier rotatably mounted adhesively coated segments whose operative surfaces correspond to the curvature of their rotational path and which segments roll off along the plane of withdrawal of the label stack which is positioned tangentially to the curvature of the adhesive segments, thereby progressively withdrawing the outermost label from such stack.

As a result this arrangement necessarily produces a relatively large interstitial space or gap between adjacent individual segments. This space or gap is necessitated by the fact that the segments perform their swinging movement essentially or largely within their path of rotation thereby requiring more space to avoid mutual contact between adjacent segments during the withdrawal operation. Consequently the gap between the segments is large and the number of segments that can be mounted on a revolving support member is limited.

The limited number of segments that can be mounted on a revolving support member with such arrangement necessarily places a limitation upon the output of the apparatus since it becomes necessary, during rapid succession of articles, to a label-receiving station, to control the motion of the adhesive segments to correspond perfectly to such rapid succession. This motion control necessarily results in undesirable conditions involving acceleration and delay.

In order to achieve an effective increase in output, my prior U.S. Pat. No. 3,450,591 teaches an arrangement including two segment carrying, revolving support members or carriers cooperating with a common transfer conveyor or gripper cylinder which grasps the labels off the adhesive segments from both support members and places them on the articles to be labeled. However, this increase in output is attained by substantially higher costs.

Therefore, one object of this invention is to provide a labeling apparatus having features corresponding substantially to those in my prior Patent but which is characterized by increased efficiency at less costs.

Thus, it is a further object of this invention to provide a labeling apparatus of the above discussed type in which the movement of the individual segments is so controlled as to delay the segments by a swinging or swivel movement which in effect swings them out of their rotational path, said swinging movement emanating from their uniform rotational movement thereby placing the segments on an arcuate path which encloses their rotational path to allow them to withdraw a label and to thereafter swing them back under an accelerated motion into their rotational path having the withdrawn label attached to them. With this arrangement, the projecting swinging movement of each segment occurs outside the zone of its rotational path, thus avoiding reciprocal impediments or contact between adjacent segments so that only a small interstitial spacing or gap is necessary between adjacent segments and the number of segments can be increased.

It is a more particular object of this invention to provide such a labeling apparatus in which the individual adhesive carrying segments are attached to the open free ends of levers which are rotatably mounted on a revolving support member

or carrier and in which the segments roll off along their entire surface in the withdrawal plane of the label stack, are the center of rotation of the levers approximately midway between the trailing edge of one segment and the leading edge of the following segment to effectively condition the projecting swinging movement of the segments and their concomitant complete temporary departure from their rotational path.

It is a further object of this invention to provide an arrangement in which the withdrawal plane of the label stack, which is spaced from the rotational path of the segments and the plane containing a tangent to such rotational path encloses an acute angle. Consequently so positioning the withdrawal plane advantageously enhances the progressive line contact between the end label of the stack and the curved surface of the segment during the rolloff motion occurring as the segment is swung out from its rotational path.

Further and more specific objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawings in which:

FIG. 1 is a diagrammatic top plan view partly in section illustrating the revolving support or carrier, the adhesive carrying segments, and the label magazine of the arrangement according to the invention.

FIG. 2 is a diagrammatic top plan view of the labeling apparatus of the invention.

FIGS. 3 to 8, diagrammatically illustrate the successive movement phases of an individual segment during withdrawal of the end label from the stack or magazine.

FIG. 9 is a cross-sectional side elevation view taken along the line 9–9 in FIG. 1, showing the arrangement of the various segments and levers.

Referring to the showings in FIGS. 1 and 2, the labeling apparatus of this invention essentially includes a continuously revolving support member or carrier 1 carrying adhesive-receiving segments 2, a stationary label magazine or container 3 accommodating a stack of labels 4, a glue or adhesive applicator roll 5, a transfer conveyor or delivery cylinder 7 equipped with gripping devices or fingers 6 and a continuously revolving feed conveyor system 9 carrying the bottles 8 to be labeled.

In the embodiment illustrated the support member or carrier 1 rotates continuously about its axis 10 in a clockwise direction and carries six adhesive-receiving segments 2 having arcuate outer surfaces. The curvature of these surfaces is such as to correspond with the rotational path indicated by the dot-dash line 11, FIG. 1. Each segment 2 includes a base that is attached to the open free ends of a lever 12. The levers 12 are rigidly connected to axles or shafts 13 that are rotatably mounted on the support or carrier 1. A toothed segment 14 is mounted on each axle 13 on the side of its axis opposite the associated lever 12. The levers 12 extend from the axles 13 in the direction of rotation of carrier 1 and each axle 13 is located approximately midway between the leading edge of one segment and the trailing edge of a preceding segment as clearly shown with reference to the lower segments in FIG. 1. Each toothed segment 14 engages or is in mesh with a toothed segment 15 carried by one arm 16′ of a bellcrank lever 16 turnably mounted on a pivot stud 18 carried by carrier 1. The other arm 16″ of each bellcrank carries a roller 17 which engages a stationary curved or cam track 19 that is shaped to impart to the segments 2 the desired swinging and rolloff movements within the arc of the end of label magazine or stack 3 at the label-withdrawing station. The studs 18 are located on a circle radially outwards of the circle accommodating the axles or shafts 13 and each stud 18 is located between adjacent axle 13.

For the purpose of accurately fixing the segments 2 during the rotation on path 11, a further lever 20 is mounted on each axle 13. Each lever 20 carries a roller 21 which engages guide track 22. This arrangement avoids the effects of an otherwise inevitable clearance space of motion between toothed segments 14 and 15 so that the adhesive segments assume their

required firm position within the zone of the circular segment of their rotational path 11.

The illustrated embodiment operates as follows:

Commencing with the position of segment 2 at the lower end of FIGS. 1 and 2, where the radius of curvature of the outer operative surface of the segment coincides with the rotational path 11, the support member or carrier 1 rotates or turns in the clockwise direction. As shown in FIG. 2 adhesive segment 2 enters the zone of an adhesive applicator roll 5 which receives glue or adhesive from means not shown. This roll has its surface tangential to the rotational path 11 so that an adhesive is applied in a known manner to the entire surface of adhesive segment 2.

As support member or carrier 1 continues to rotate the adhesively coated segment 2 enters the zone of the label magazine 3 where it is swung out of rotational path 11 by reason of the roller 17 rolling along cam track 19 causing swinging movement of bellcrank lever 16 which through the engaged or meshed segmental gears 15, 14 swings lever 12 and segment 2 outwards and with a delayed movement imparts the rolloff movement to segment 2 in the withdrawal plane to remove the end label 4 from the stack. FIGS. 3 to illustrate the most essential phases of the movement action of each segment 2. Having thus withdrawn the end label 4 from the stack 3, by the action of the adhesive applied to the segment, the segment now carrying a label reenters at an accelerated pace the rotational path 11.

As the support member or carrier 1 continues to revolve the label-carrying segment enters the label transfer station adjacent carrier or gripper cylinder 7, the gripped fingers 6 of which are positioned to be tangential to rotational path 11. During this phase of operation and in a known manner, the gripper cylinder grips and peels off the label from segment 2 and carries it to the label-applying station into the rotational path of a bottle 8 moving along conveyor mechanism 9 where the label is applied to the bottle.

Thereafter the final and complete attachment of the label to the bottle is effected in a manner known in the art but not shown in the drawing.

As shown the support or carrier turns clockwise, the transfer cylinder turns counterclockwise and the conveyor 8 also turns clockwise.

Further the fact that the stack is spaced from path 11 such that the withdrawal plane of the end label 4 in stack or magazine 3 encloses an acute angle with the tangent to the rotational path 11, enhances the progressive line contact between the end label of the stack and the curved surface of the segment during the rolloff motion of the latter occurring as the segment is swung out from rotational path 11.

I claim:

1. Apparatus for labeling bottles or other articles including a stationary label magazine for accommodating a stack of labels from which the end label is individually withdrawn, a revolving carrier located in operative relation to said magazine, a plurality of label removing segments having cured outer surfaces adapted to receive an adhesive, means mounting said segments on said carrier for uniform rotational movement with and swinging movement relative to the carrier including a lever carrying each segment, an axle mounting each lever and, each said axle being disposed approximately midway between the trailing edge of one segment and the leading edge of the adjacent segment, and a bellcrank lever operably associated with each segment carrying lever for swinging the same and means controlling the movement of successive segments such that beginning from the point of departure from their uniform rotational movement, their movement is delayed by a swinging out movement which places then into a rotational path enclosing the path of their uniform movement for successively withdrawing the end label from the stack and thereafter said segments are swung back at an accelerated pace into the path of their uniform rotational movement with a label attached thereto.

2. A labeling apparatus as claimed in claim 1 and cooperating segmental gear means carried in part by each axle and in part by one arm of the adjacent bellcrank lever for transmitting swinging motion of the bellcrank levers to said segment carrying levers.

3. A labeling apparatus as claimed in claim 2 and the other arm of each bellcrank lever carrying a follower means, and a guide track engaged by such follower means and shaped to impart movement to the bellcrank lever such as to swing out the segments, effect their delayed rolloff movement during label withdrawal, and accelerate their return swing movement into their uniform rotational path.