United States Patent

[11] 3,625,797

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[22] Filed **Jan. 9, 1970**
[45] Patented **Dec. 7, 1971**
Continuation of application Ser. No. 602,296, Dec. 16, 1966, now abandoned. This application Jan. 9, 1970, Ser. No. 1,596

[54] LABELING MACHINE ATTACHMENT FOR APPLYING LABELS TO POLYGONAL CONTAINERS

7 Claims, 12 Drawing Figs.

[52] **U.S. Cl.** **156/446,** 269/61, 156/187, 156/189, 156/475, 156/538
[51] **Int. Cl.** **B65c 9/30,** B65c 3/12
[50] **Field of Search** ..... 156/184, 185, 187, 189, 446, 457, 475, 477, 538, 567, DIG. 3, DIG. 4, DIG. 10, DIG. 27; 118/503; 214/1 Q, 652; 269/61

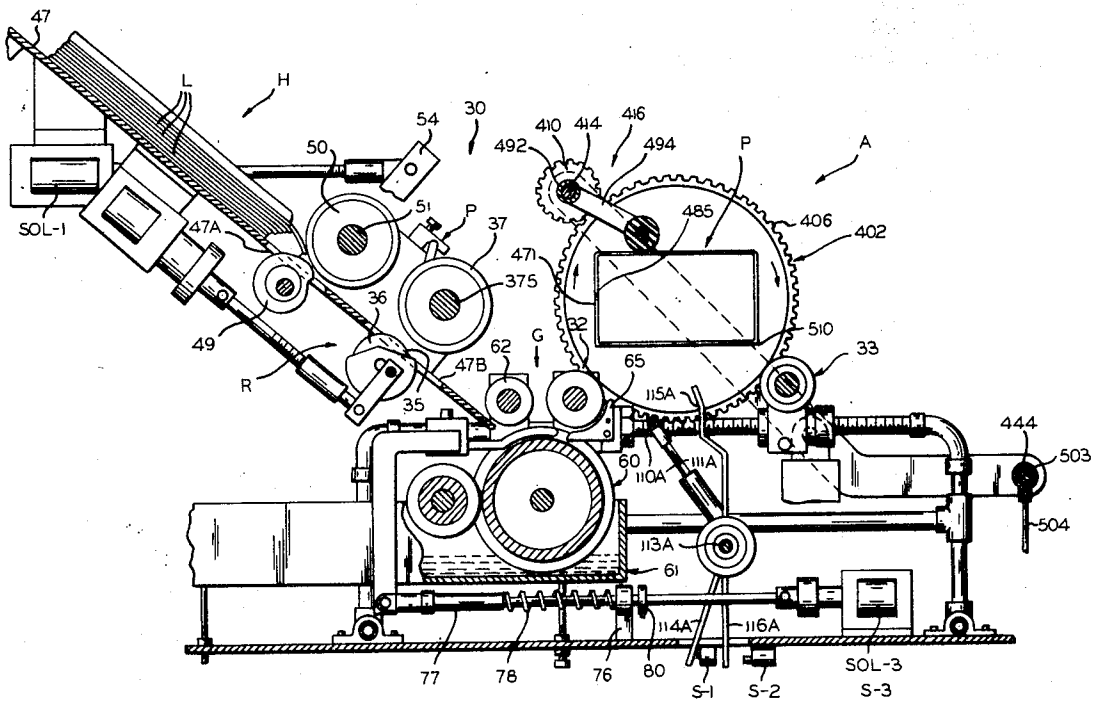
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Assistant Examiner—James M. Hanley
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ABSTRACT: An attachment for application to round container labeling machines of the type shown in U.S. Pat. No. 3,278,359, which is in the form of a swing lever assembly adapted to be pivotally mounted on the machine adjacent its round container support rollers, with the swing lever assembly being pivotally mounted about an axis paralleling such support rollers, in which the assembly carries a pair of spaced-apart spin wheels positioned to be lowered into engagement with the support rollers for actuation thereby. The spin wheels are adapted to mount a polygonal-shaped container between them by engaging the ends of same, and a pressure roller carried by the assembly rides on the container to hold the label in place as it is applied thereto on actuation of the label-feeding mechanism of the basic machine, which actuation occurs when the spin wheels engage the support rollers and the rotating container grips a trip switch.



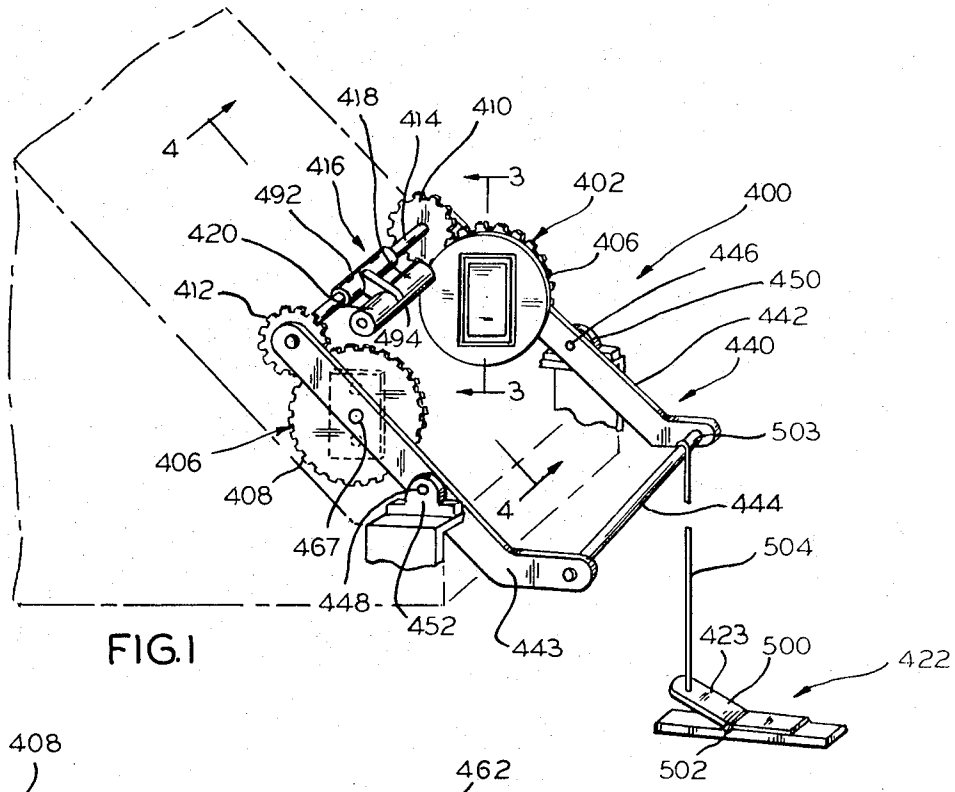


FIG.1

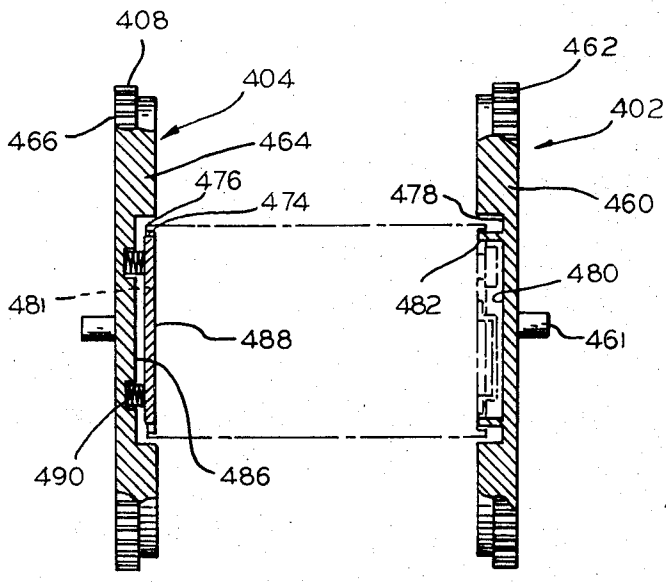


FIG.3

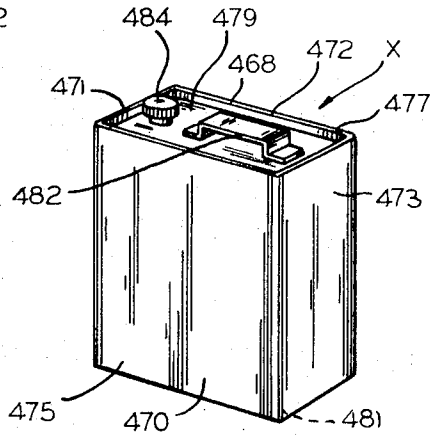
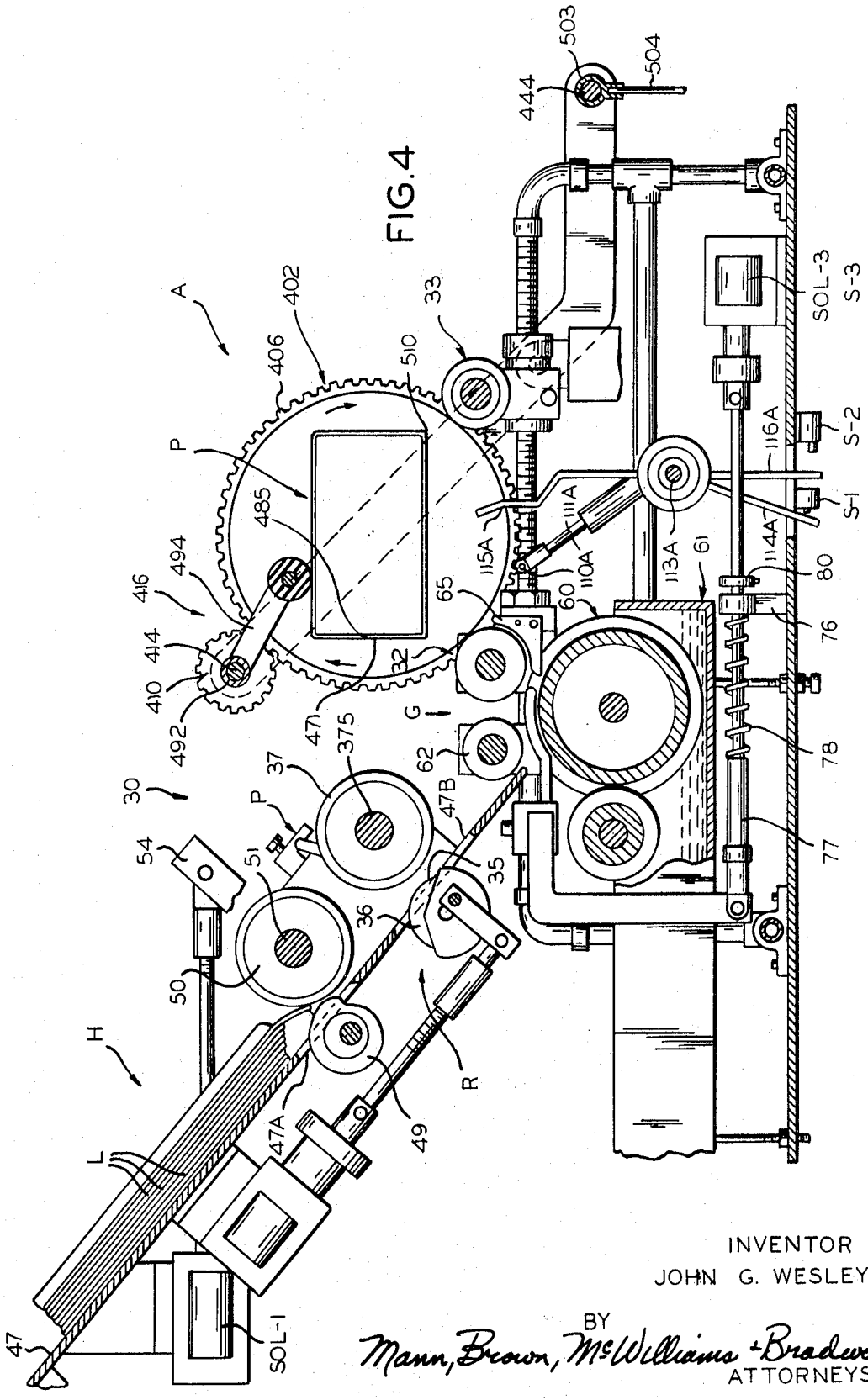


FIG.2

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FIG. 4



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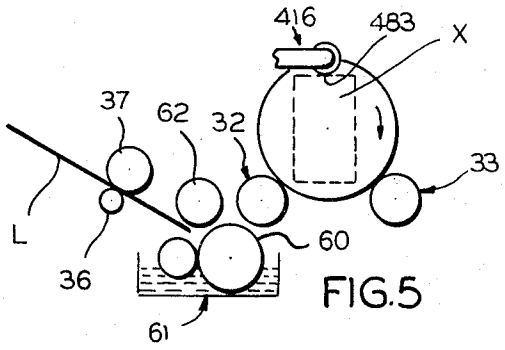


FIG.5

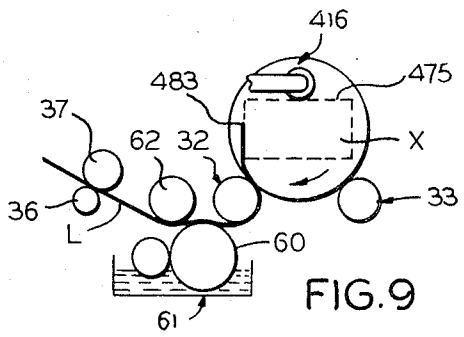


FIG.9

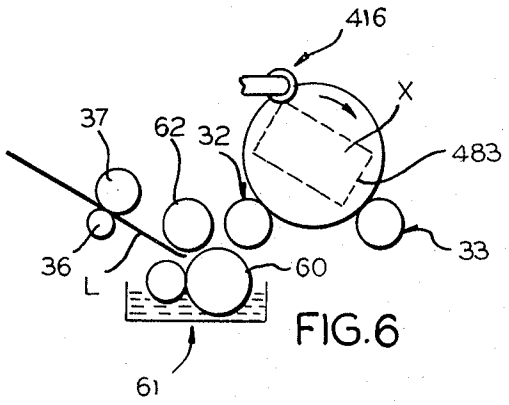


FIG.6

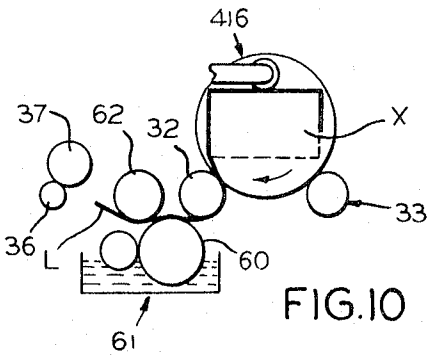


FIG.10

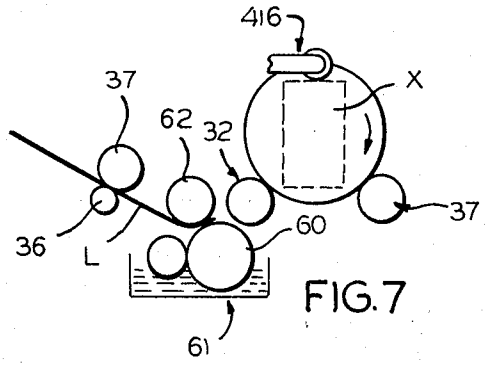


FIG.7

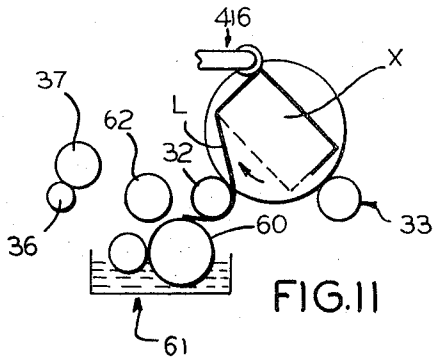


FIG.11

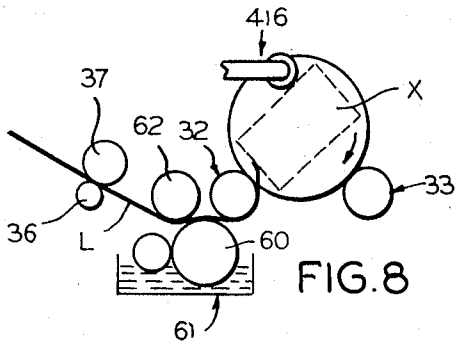


FIG.8

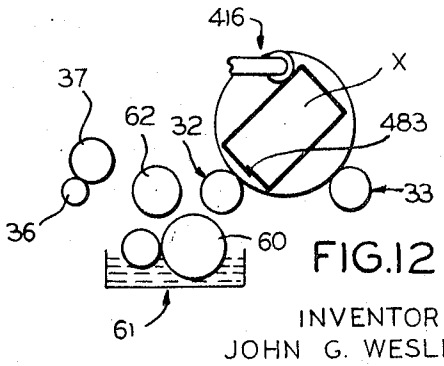


FIG.12

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LABELING MACHINE ATTACHMENT FOR APPLYING LABELS TO POLYGONAL CONTAINERS

This invention relates to the semiautomatic application of labels to containers of quadrilateral cross-sectional configuration, and more particularly, to the provision of an attachment for round container labeling machines to adapt them to label square or rectangular containers.

The labeling machine of my U.S. Pat. No. 3,278,359 provides an arrangement for conveniently applying labels to round containers in which the containers are one-by-one laid sidewise on a pair of rotating support rollers, and the labels for same are separated from a supply of labels in a hopper, fed past a glue station where glue is applied thereto, and guided into cooperation with the container in timed relation to the rotation of the container, so that the label becomes affixed to the round side wall of the container in the manner desired. In accordance with the invention of that patent, the labeling machine is arranged both to handle labels of different lengths and to either coat the entire length of the label or coat only selected spaced portions of same, such as the leading and trailing ends of the label.

Utilization of rotational movement of round containers (about their longitudinal axes) as part of the label applying procedure is not directly applicable to polygonal containers of the familiar rectangular or square transverse cross-sectional configuration shapes, as placing such containers on rotating rollers will not affect the uniform rotational movement that is required for proper sequencing purposes.

A principal object of this invention is to provide a labeling machine arrangement that will label polygonal containers with the same facility that round containers may be labeled, especially when employing the machine of my said patent.

Another principal object of the invention is to adapt labeling machines of the type disclosed in may said patent to handling containers of the polygonal configuration.

Other objects of the invention are to provide an attachment for application to the machine of my said patent and make available for labeling polygonal containers all the advantages made available by the machine of my said patent for labeling round containers, and to provide an attachment of the type indicated that is economical of manufacture, convenient to apply and use, and long lived in operation.

In accordance with this invention, there is provided a swing lever assembly that may be pivotally mounted on the round container labeling machine adjacent its support rollers and carrying a pair of opposed spin wheel assemblies that mount the container to be labeled and are brought by gravity into tractional engagement with such support rollers for rotation of the container carried thereby.

The swing lever assembly includes a pressure roller arrangement for holding the label against the container it is being applied to, and the spin wheel assemblies are coupled together through gearing for synchronous rotation. Application of the spin wheel assemblies to the machine support rollers, which continuously rotate, actuates a switch control arrangement that sets up the machine for its label-gluing and -applying cycle, and starts rotation of the container through the tractional engagement that the spin wheel assemblies have with the support rollers, which rotation brings the container into engagement with a trip switch that in turn effects actuation of the label-gluing and -applying mechanism in the time sequence required to properly apply the label to the container. After the label is applied to the container, the swing lever assembly is actuated to lift the spin wheel assemblies from the support rollers for removal of the now labeled container, and application thereto of another container to be labeled.

Still other objects, uses, and advantages will be obvious or become apparent from a consideration of the following detailed description and the application drawings in which like parts are indicated by like reference numerals throughout the several views.

In the drawings:

FIG. 1 is a diagrammatic perspective view of the attachment as it might be applied to the machine of my said patent, with the machine being indicated only in outline form in the showing of FIG. 1;

FIG. 2 is a perspective view of a container of the type that may be labeled by practicing the invention of this application;

FIG. 3 is a diagrammatic cross-sectional view through the spin wheel assemblies, diagrammatically illustrating the nature of same, and taken substantially along line 3–3 of FIG. 1;

FIG. 4 is a diagrammatic cross-sectional view taken substantially along line 4–4 of FIG. 1 illustrating the manner in which the attachment is employed in association with the machine round container support rollers; and

FIGS. 5–12 are diagrammatic sequence views illustrating the manner in which a label may be applied to a polygonal container employing the arrangement of this invention.

However, it is to be distinctly understood that the drawing illustrations provided are supplied primarily to comply with the requirements of the patent code, and that the invention may have other specific embodiments that will be obvious to those skilled in the art, and which are intended to be covered by the appended claims.

GENERAL DESCRIPTION

Referring first to FIG. 4, which shows a number of the basic components of the machine of my said patent, it will be seen that such machine **30** generally comprises an inclined adjustable hopper H in which a supply of labels L are supported for separation and feeding one by one past a glue station G, and after glue has been applied thereto, are guided into cooperation with a rotating container that is disposed in label applying station A. Round containers are applied to a pair of constantly driven support rollers **32** and **33**, with the roller **32** being located on a fixed axis adjacent to and above the output side of the glue station G, while the other support roller **33** is mounted for adjustment toward and away from the roller **32** so that containers of different diameters may be supported in the desired relation by the two rollers **32** and **33**.

As described in said patent, the labels L are fed one at a time from the hopper H to a register station R that is defined in part by a retractable register stop **35**, and when the leading edge of a label L is engaged with the stop **35**, such leading edge is located between a pair of constantly driven normally separated feed rollers **36** and **37** so that upon withdrawal of the stop **35** and on engagement therewith of the two feed rollers **35** and **36**, the label L that has been advanced into the register station is withdrawn and advanced to and through the glue applying station G for application to the container.

In accordance with this invention, swing lever assembly **400** is applied to the machine **30** for pivotal movement about an axis that extends transversely of the machine and parallel to the axes of rollers **32** and **33**, and carries a pair of spin wheel assemblies **402** and **404** between which a container X of polygonal configuration (see FIG. 2) may be applied in the position indicated in FIGS. 4–12 for application thereto of a suitable label L.

The spin wheel assemblies **402** and **404** are respectively toothed as indicated at **406** and **408**, respectively, for meshing engagement with the respective pinion gears **410** and **412** that are keyed to shaft **414** that is journaled in the swing lever assembly **400** for rotational movement, for the purpose of synchronizing the rotational movement of the spin wheel assemblies. Shaft **402** carries a gravity operated pressure roller assembly **416** including a pair of spaced rollers **418** and **420** that are intended to ride along the side surfaces of the container in the manner indicated in FIGS. 4–12 to hold the label in place as it is being applied to the container X.

The swing lever assembly itself is gravity operated in the form illustrated, with a foot treadle assembly **422** being provided so that the operator on pressing the foot treadle **42** may raise the spin wheel assemblies **402** and **404** free of the support rollers **32** and **33** for application thereto of a container X

that is to be labeled, with the pressure roller assembly 416 being disposed by hand relative to the container in the manner indicated in FIG. 4. The operator then releases the foot treadle 423, whereby the swing lever assembly 400 under gravity brings the spin wheel assemblies 402 and 404 into tractive engagement with the rollers 32 and 33, as well as into engagement with a roller 110A carried on arm 111A fixed to shaft 113A, which shaft also has affixed thereto an arm 114A that engages can sensing control switch S–1 in the same manner as illustrated for the same switch in FIG. 4 of my said patent. Actuation of the normally open switch S–1 sets the machine up for, but does not actuate, a label-gluing and -applying cycle with respect to a label L that has been moved into the register position, rollers 32 and 33 in the meantime rotating the spin wheel assemblies 402 and 404 together with container X, which has the effect of the container X tripping a sensing arm 115A fixed on a sleeve 112A that is rotatable on shaft 113 and has an operating arm 116A extending downwardly therefrom to engage and actuate a normally open control switch S–2, which switch actuation initiates the operation of the sequencing of the parts of the machine 30 which advance the label L through the gluing station G and into application with the container following the sequence suggested by FIGS. 5–12 and in the timing desired relative to the speed of rotation of container P. After the label has been applied to the container, the operator presses foot treadle 423 to lift the spin wheel assemblies 402 and 404 from engagement with rollers 32 and 33 so that rotation of the container X ceases and it may be removed for application of another container thereto that is to be labeled in accordance with this invention.

My said U.S. Pat. No. 3,278,359 (the disclosure of which is incorporated herein by this reference) may be referred to for a detailed description of the component parts and operation of the machine therein disclosed, some of the parts thereof being shown in the drawings of the instant application, indicated by identical reference numerals, to facilitate a more ready understanding of the nature of the present invention.

SPECIFIC DESCRIPTION

The machine 30 as disclosed in my said patent has a pair of side frame members (not shown) that are located in spaced relationship, and at the rear portions these frame members have upstanding support plates that serve as a mounting means for the hopper H and for other elements of the machine. The hopper H is provided with a sloping bottom plate 47 that slopes downwardly and has a pair of adjustable side guides (not shown) to provide a hopper in which a stack of labels L are positioned.

At the forward end of the hopper, a label separating means is provided of the top feed type, and has an adjustable but normally stationary rubber retard roller 49 mounted on an adjustable axis in an opening 47A in plate 47. Above the retard roller and on an axis parallel thereto are one or more separating rollers 50 that are fixed on a freely adjustable supporting shaft 51 (which is supported and driven in the manner shown and described in said patent), which includes suitable gearing actuated by a swing arm 54 being moved to shift a rubber roll into engagement with a constantly driven knurled roll fixed to the shaft 37S which carries feed rolls 37, this being done by the operation of a solenoid SOL–1 (which is controlled in the manner described in my said patent).

A photoelectric unit P is employed to detect when a label being advanced has reached the register position. The unit P is fully described in said patent.

As indicated in FIG. 4, the feed rollers 36 and the register stop 35 project through an opening 47B in the plate 47, and the hopper plate 47 extends beyond or to the right of the opposed feed rollers 36 and 37 to a point just above the left-hand side of the relatively large coating roller 60 that forms a part of glue coater 61 that is located just beneath and somewhat to the left of the support roller 32 (as shown in FIG. 4). Thus as a label is advanced by the feed rollers 36 and 37 from a register position, such label moves along the plate 47 and beneath the guiding and feeding roller 62 and thence into engagement with the coating roller 60 that is constantly rotating, from which it moves into label-applying position beneath the support roller 32 where the leading edge of the label strikes a series of spaced guide plates 65 that direct the leading edge of the label outwardly from between the guide plates 65 and the support roller 32 into a position where it will engage the container in the manner suggested by FIG. 8, in the manner hereinafter explained in detail.

Other related parts of the machine of my said patent are shown in FIG. 4 with identical reference numerals being applied thereto, it being understood that reference may be had to my said patent for a complete description of the component parts involved.

The swing lever assembly 400 generally comprises a swing lever frame 440 which includes spaced apart lever members 442 and 443 connected together at their ends by the shaft 414 and the handle bar 444. Shaft 414 is journaled for rotation in lever members 440 and 442 in any suitable manner.

The respective lever members 442 and 443 are respectively journaled in, as by the respective pins 446 and 448, suitable bearing units 450 and 452, which are suitably removably applied to suitable support members 453 and 455, respectively, secured to machine 30 in any suitable manner. Bearing units 450 and 452 may be adjustably mounted in their supports to dispose the spin wheel assemblies 402 and 404 for simultaneous engagement with the support rollers 32 and 33 when the swing lever assembly is to be operated to apply a label to a polygonal container such as container X.

As indicated in FIG. 3, the spin wheel assemblies 402 and 404 are similar. The spin wheel assembly 402 comprises, in the form shown, a disc member 460 that is formed with a stub shaft portion 461 adapted to be received in a suitable mounting opening in the arm 442 for purposes of removably journaling same on the lever arm 442, and has its rim portion 462 suitably formed to define the gear teeth 406. Similarly, spin wheel assembly 404 comprises a spin wheel member 464 formed with a stub shaft portion 465 for reception in mounting opening 467 of arm 443, and has its rim 466 suitably formed to define gear teeth 408. Stub shaft portions 461 and 465 may be suitably formed to receive locking rings or the like (not shown).

Spin wheels 460 and 464 are formed to receive the end portions 468 and 470 of the container X. FIG. 2 illustrates one familiar form of container X in which the upper end portion 468 is recessed as at 470, the container defining an upper ridge portion 472 thereabout. The lower end 470 of the container is similarly formed as indicated at 474 and 476 of FIG. 3. The container X defines narrow side walls 471 and 473, wide side walls 475 and 477, top end wall 479, and bottom end wall 481. Container X is usually seamed down the mid portion of its narrow side 471, and while the label to be applied to a container X may be started at any desired point about its periphery, I prefer that the label start and end at the can seam, indicated at 483 in FIGS. 4–12.

To enable the spin wheels 460 and 464 to mount the container X, in the form shown the spin wheel 460 is recessed as at 478 and 480 to define a rectangular ridge portion 482 that is adapted to be received within and substantially complement the configuration of the ridge portion 472 of the container upper end 468. Recess 480 is made deep enough to accommodate the handle 482 and opening cover 484 of the container.

The spin wheel 464 in the form shown is similarly recessed as at 486 to receive the lower end portion 474 of a container P as well as a spring plate 488 that is outwardly biased by suitable springs 490 and is proportioned to fit within the recessed portion 474 of the container P. Spring plate 488 and spin wheel 464 may be provided with suitable interengaging portions to preclude removal of the spring plate 488 on removal of the container P, as will be apparent to those skilled in the art. The recess 486 is proportioned to substantially comple-

ment the exterior configuration of the container lower end portion 473.

The pressure roller assembly 416 comprises a sleeve 492 received over the shaft 414 and having fixed thereto a lug 494 on which rollers 418 and 420 are journaled in any suitable manner.

In practice, for each size of container X to be labeled, there will be a separate set of spin wheel assemblies 402 and 404 to accommodate same, it being contemplated that the spin wheel assemblies 402 and 404 will be readily replaceable when it is necessary to change container sizes, as part of the procedure for setting up the basic machine 30 to handle a different size polygonal container. Lug 494 may be made telescoping in nature to permit the rollers 418 and 420 to have the relationship with indicated in FIGS. 4–12, or alternately, arms 442 and 443 are formed with a plurality of openings 467 to journal different sizes of spin wheels.

The foot treadle assembly 422 comprises a foot treadle 423 including leaf member 500 hinged to the floor as at 502 and connected to the swing lever assembly 400 by a tie rod 504 having suitable connection to sleeve 503 mounted on handle 444.

In use, assuming that the swing lever mechanism 400 has been applied to machine 30, and labels of a suitable size have been applied to hopper H for application to a particular sized container X that fits the size of the spin wheels 460 and 464 being employed, and the machine 30 is otherwise set up as described in my said patent to label a quantity of such containers X, the operator presses on foot treadle member 500 to raise the swing lever assembly 404 for application thereto of a first container X, which is applied to the spin wheel assemblies in the manner suggested in FIG. 3, the container lower end portion 470 being pressed against the spring plate 488 so that the end portion 470 is disposed within recess 486 of spin wheel 464 and the ridge portion 482 of spin wheel 460 may be received within the recess portion 470 of the container end portion 468. The pressure roller assembly 416 is disposed against the container in the manner suggested by FIG. 4, either by applying the container X to the spin wheels 460 and 464 with the rollers 418 and 420 resting against same, or by applying the container in its indicated mounted position between the spin wheels 460 and 464 with the pressure roller assembly hanging substantially vertically, whereby it can be swung clockwise of the showing of FIG. 4 until it rests on the container X.

The container X should also be positioned so that the seam side 471 faces away from the operator, who will be standing at the right of FIG. 4, with the spin wheel assemblies being disposed such that the wide sides of the container X are substantially horizontal. Assuming that the machine is otherwise operating, rollers 32, 33 and 60 will be continuously operating, as part of the normal functioning of machine 30.

The operator then releases the foot treadle 423 and the swing lever assembly 400 swings by gravity about its pivot pins 446 and 448 to lower the spin wheel assemblies 402 and 404 into tractive engagement with rollers 32 and 33. This also brings the spin wheel assembly 402 against the roller 110A of swing arm 111A and thus closes switch S–1 that sets the machine to feed a label L from the register station stop toward the glue station G.

Since rollers 32 and 33 are constantly rotating, the tractional engagement of the spin wheel assemblies 402 and 404 therewith will start their rotation in the direction indicated by the arrows of FIG. 4, and when the container corner 510 strikes detecting arm 115A, the solenoid SOL–2 is actuated to withdraw the register stop 35 and bring rollers 36 and 37 into engagement with the label to effect feeding of the label in coordination with the movement of the can seam 483, as indicated in FIG. 5. The spin wheel assemblies 402 and 404 continue to turn the container X through the positions of FIGS. 6, 7 and 8, at which point the leading end of the label engages with the seam side 471 of the container at the seam and adheres thereto. The container proceeds to rotate to the position of FIG. 9, with the label leading end adhering to the seam side of the container and the pressure rollers 418 and 420 riding along the container side above the leading end of the label.

The container continues to turn, with the pressure rollers riding over the leading end of the label and down its length to hold same in engagement with the container, as the container seam side moves clockwise (in the showing of FIGS. 4–12) under the roller assembly 416 and to the position of FIG. 10.

The operator then presses on foot treadle member 423 to raise the swing lever assembly away from the support rollers 32 and 33 so that the now labeled container X can be removed and the next container applied thereto for labeling in like manner. This automatically moves the next label to the register stop position in the manner described in my said patent.

It will therefore be seen that I have provided a simplified yet effective manner of applying labels to polygonal containers, utilizing the basic features of the machine shown in my said patent, as modified by the attachment of the present invention. This invention permits labeling of polygonal containers of the type indicated to be labeled as readily as round containers and with the same adjustability as to container and label size as contemplated for round containers by my said patent.

The foregoing description and the drawings are given merely to explain and illustrate my invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled in the art who have my disclosure before then will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. In a labeling machine for applying labels to containers including a label supply hopper, a glue-applying station, and a labeling station including a pair of support rollers upon which a round container to be labeled may be supported and rotated, and means for feeding labels from the hopper through said glue-applying station to label-applying relation at the labeling station, an attachment therefor for applying labels to polygonal containers, said attachment comprising:

a swing lever adapted to be removably mounted in operative position relative to said machine intermediate its ends for pivotal movement about a horizontal axis paralleling said labeling station rollers and disposed to one side of same,

said swing lever adjacent one of its ends having journaled thereon a pair of spaced apart spin wheels including means for mounting a polygonal container therebetween by engaging the ends thereof,

said spin wheels being positioned to engage said labeling station rollers when said swing lever is mounted in its operative position,

said swing lever at said one end thereof carrying pressure roller means for engaging the sides of a container mounted between said spin wheels,

means for biasing said spin wheels against said labeling station rollers when the polygonal container is mounted therebetween,

and means for actuating said rollers and said feeding means to feed a label from said hopper into label-applying relation to the polygonal container mounted on said swing lever.

2. In a labeling machine for applying labels to containers including a label supply hopper, a glue-applying station, and a labeling station including a pair of support rollers upon which a round container to be labeled may be supported and rotated, and means for feeding labels from the hopper through said glue-applying station to label-applying relation at the labeling station, an attachment therefor for applying labels to polygonal containers, said attachment comprising:

a swing lever removably mounted intermediate its ends for pivotal movement about a horizontal axis paralleling said labeling station rollers,

said axis being disposed to one side of said labeling station rollers,

said swing lever adjacent one of its ends having journaled thereon a pair of spaced-apart spin wheels including means for mounting a polygonal container therebetween by engaging the ends thereof,

said spin wheels being positioned to engage said labeling station rollers when lever one end is swung toward same about said axis,

said swing lever at said one end thereof carrying pressure roller means for engaging the sides of a polygonal container mounted between said spin wheels,

means for biasing said spin wheels against said labeling station rollers when the polygonal container is mounted therebetween,

and means for actuating said rollers and said feeding means to feed a label from said hopper into label-applying relation to the polygonal container mounted on said swing lever.

3. The attachment set forth in claim 2 wherein:

said swing lever comprises a frame including a pair of spaced-apart lever members pivotable about said axis,

said levers at said one end of said swing lever being joined by a shaft member,

said levers at the other end of said swing lever being in fixed relation,

said pressure roller means comprising a sleeve journaled on said shaft and journaling a roller positioned to be disposed against a sidewall of a polygonal container mounted between said spin wheels.

4. The attachment set forth in claim 3 wherein:

the rims of said spin wheels are toothed,

said shaft adjacent either end thereof being keyed to gear means meshing with the teeth of the respective spin wheels,

whereby said spin wheels rotate at synchronous speed when engaging said support rollers.

5. The attachment set forth in claim 4 including:

off-on switch means actuated by one of said spin wheels on engaging said support rollers to actuate said rollers,

and trip switch means actuated by rotation of the polygonal container mounted by said spin wheels to actuate said feeding means.

6. The attachment set forth in claim 5 including:

foot treadle means connected to said other end of said swing lever for lifting said spin wheels free of said support rollers.

7. A device for applying labels to polygonal containers, said device comprising:

a swing lever adapted to be mounted intermediate its ends for pivotal movement about a horizontal axis,

said swing lever adjacent one of its ends having journaled thereon a pair of spaced-apart spin wheels including means for mounting the container for application of a label thereto by engaging the ends thereof,

said swing lever one end also carrying pressure roller means for engaging a container mounted between said spin wheels,

said swing lever at the other end thereof including handle means for swinging said swing lever between a container rotating position in which said spin wheels engage drive means and the container is disposed for application thereto of a label, and an inoperative position in which said spin wheels are disposed away from the drive means for application and removal of the container to and from said spin wheels.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,625,797 Dated December 7, 1971

Inventor(s) John G. Wesley

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, line 6, between "when" and "lever" insert -- said --.

Signed and sealed this 30th day of May 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents