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R. WETZIG

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DEVICE FOR APPLYING LABELS ON PLANE SURFACES

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2 Sheets-Sheet 2

Fig. 4.

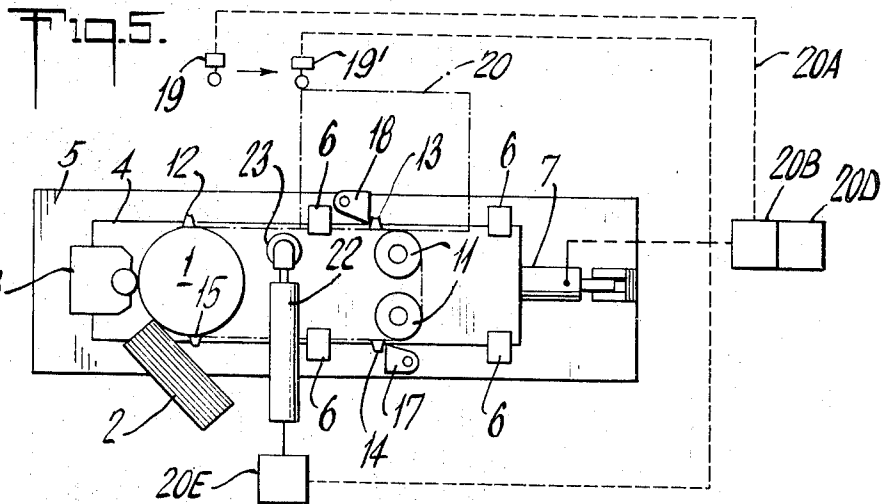
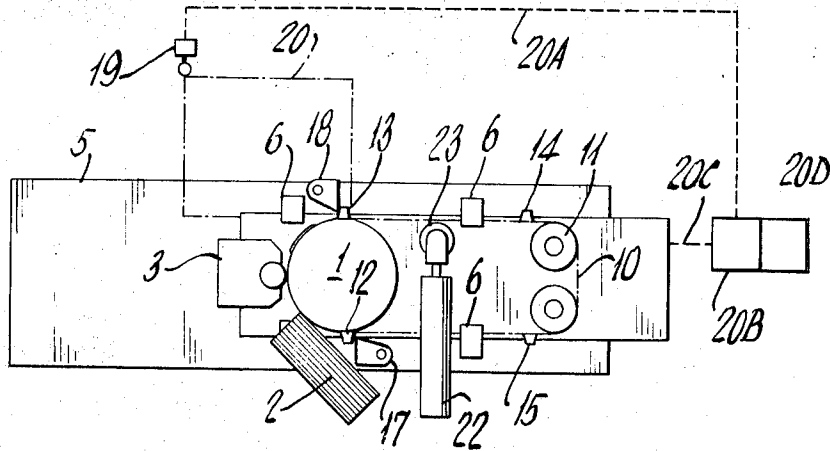
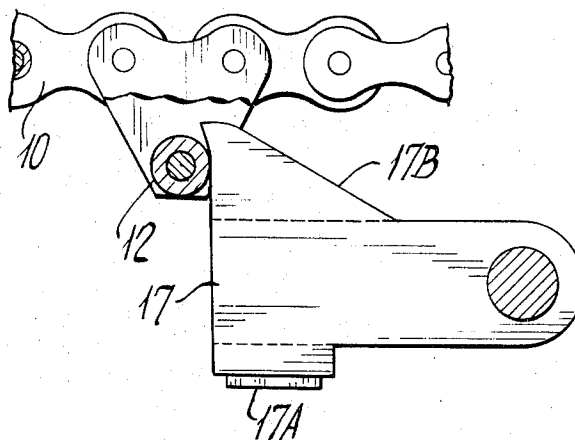


Fig. 6.



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## DEVICE FOR APPLYING LABELS ON PLANE SURFACES

Rudolf Wetzig, Leipzig, Germany, assignor to Ingenieur-  
buro fur Rationalisierung der Suss- und Dauerback-  
warenindustrie, Leipzig, Germany

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P 21 35 603.6

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7 Claims

### ABSTRACT OF THE DISCLOSURE

A unit of label supplying, label gluing and glued label applying devices is mounted on a base plate which is slidable along the path of the cartons or other units to be labelled. The label applying device is a drum having coaxially therewith, a sprocket which engages a chain replaceable along the slidable base plate. A fixed base plate, parallel to the slidable one, has stationary stop means mounted thereon and inter-engageable with movable stop means, secured to the chain. Upon the arrival of a carton, a signal first causes the slidable base plate, with the equipment thereon, to move along the carton; after completion of this motion it causes the slidable base plate to return to a prior position. During the first motion a label is supplied by the label supplying part of the unit; during the return motion the label is applied to the carton, on a plane surface thereof.

### BACKGROUND AND NATURE OF THE INVENTION

The application of labels to cartons has been performed by moving the carton relative to and along the labeling machine under uniform speed conditions and causing the machine to take a label from a magazine by suction means, to apply glue thereto and then to press the glued label against the surface of the carton. These machines required special drives for the relative motions, which were costly and also were applicable only to cartons continuously arriving on the conveyor. When the carton feed was not exactly within the predetermined speed limits and was, for example, actuated pneumatically (as in many pneumatically operated packing devices) it was impossible to use such a labelling machine.

The invention reduces the complexities and cost of the drive arrangement and makes the labelling machine usable under desired variations of feed and speed conditions. At the same time it keeps the dimensions of the machine most limited; it can be used in cooperation with products of any desired packing machine or other source of structures to be labeled, and has other advantages which will become obvious to a person skilled in the art upon perusal of the following disclosure.

For the indicated purposes, the invention provides a base plate or the like, slidable on and along a fixed support; a label supply, label gluing and glued label applying unit on the base plate; and normally stationary stop means on the fixed support, engageable with stop means which are moved along the slidable base plate by the label applying device under the control of carton-actuated signal means.

In the drawings:

FIG. 1 is a front view of the new machine;

FIG. 2 is a plan view of the same;

FIG. 3 is a sectional view taken along lines 3—3 in FIG. 2;

FIGS. 4 and 5 are plan views similar to FIG. 2, but showing different positions of the machine; and

FIG. 6 is an enlarged plan view of a detail from FIG. 2, 4 or 5.

Referring first to FIGS. 1 to 3: labelling drum 1, label magazine 2 and glue applying roller unit 3 are mounted on a base plate 4, as is usual, but according to the invention base plate 4 is horizontally slidable reciprocally above and parallel to a stationary base plate 5 which has guides 6 for horizontally guiding the slidable plate 4. Stationary plate 5 also supports a slide actuator, such as horizontal fluid pressure cylinder 7 on holding means 7A for hydraulic or pneumatic operation of a piston 7B, connected to slidable plate 4 by a fitting 7C, in order to cause reciprocation of the slidable base plate above and along the fixed base plate.

In further accordance with the invention labelling drum 1 has, coaxially and rigidly secured thereto and shown as disposed therebelow, a sprocket 8, the pitch diameter of which equals the effective diameter of label drum 1. Centrally to this sprocket and the overlying labelling drum there is provided a vacuum column 9, known by itself, to apply suction, through the drum, to labels in magazine 2 when the supply of labels is required.

As shown in FIGS. 2 and 4, chain 10 is wrapped around sprocket 8 as a loop of 180° extension and this chain also runs over further sprockets 11 which are spaced from the first-mentioned or drum-connected sprocket in the direction of relative motion between the labelling unit 1 to 3 and the stationary base plate 5. Chain 10 has stop elements 12, 13, 14, 15 secured thereto at uniform distances. These stops are engageable with stationary stop means 17, 18 secured to stationary holders 16 on base plate 5. Depending on the position of chain 10, selected stationary stops 17, 18 are engaged with the chain, always behind one of the chain mounted stop means such as 14 or 15. For this purpose (FIG. 6) a spring 17A presses stationary stop 17 into engagement with a chain stop 12, moving toward the right, while allowing stop 12 to move over cam surface 17B on the return trip.

The entire arrangement is compact, as may be noted mainly from inspection of FIG. 3.

Reference now will be made to the positions of FIGS. 2 and 4 to explain the labelling operation. In either of these positions the chain is at rest. Assuming that, in the position of FIG. 2, limit switch 19 senses the arrival of a carton 20 (which is received on any suitable conveyor, not shown, along a run of chain 10 from sprocket 8 to sprocket 11), this switch by conventional electric circuitry 20A can operate a three-way valve 20B, which by means of duct 20C brings pressure or waste connection to one end of cylinder 7, from a suitable pressure source or pressure sink, not shown. As a result, piston 7B moves slidable base plate 4 towards the right of FIG. 2 until the slidable plate with the equipment thereon reaches the position of FIG. 4. The stationary stop 18 then elastically engages behind chain stop 13, stopping chain 10.

The rightward motion of the labelling unit, along the carton, has turned drum 1, on vacuum column 9, by 180°. During this motion, a label 21 has been supplied from magazine 2 by suction, as is known from other labelling machines. This label is supplied with glue as it passes gluing unit 3, and is then brought into position shown in FIG. 4, the end position of slidable base plate 4 at the right end of its travel. By then, chain stop 13 has been brought to a point behind stationary stop 18, as noted.

Suitable automatic means, such as reversing control 20D (FIG. 1), then reverses the pressure conditions in cylinder 7 through duct 20C, thereby bringing sliding base plate 4 back into the original position shown in FIG. 2. Meanwhile, chain 10 is immovable relative to stationary base plate 5, due to the engagement of stationary and chain stops 18, 13. Accordingly, the label drum 1 now rolls back along carton 20, over label 21, which it thereby glues to the carton. The carton then is removed from the machine.

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These processes are repeated whenever new cartons arrive, regardless of their speed and frequency of arrival. They must only be kept in contact with the machine for a time interval sufficient for the rightward-leftward motions of piston 7B and gluing unit 1, 2, 3.

While the device, as described up to here, applies a label to a flat surface of the carton, between sprockets 8 and 11, it can also apply a label around a corner of the carton. For this purpose it can have an additional control valve 20E and cylinder 22 (FIG. 5), for moving a pressure roller 23 at right angles to chain 10, along a front surface of carton 20. For this operation, limit switch 19 is brought into position 19'.

What is claimed is:

1. Apparatus for applying labels to articles comprising an article conveyor, a labelling station adjacent said conveyor, means for stopping articles on the conveyor at said labelling station, said labelling station comprising a fixed base, a movable base having guide means for guiding it in reciprocal movement relative to said fixed base and adjacent a surface of an item to be labelled, means for producing reciprocal movement of said movable base, means responsive to the arrival of an item at the labelling station for controlling said means for producing movement of said movable base, a label applying drum rotatably mounted on said movable base, a label supply adjacent said drum, a sprocket drivingly connected to said drum, a chain trained around said drum and around an idler sprocket mounted on said movable base, stop means fixed relatively to said fixed base and cooperating with stop means on said chain whereby as said movable base is reciprocated in a plane relative to said fixed base rotation of the drum about an axis normal to the plane in which said movable base reciprocates is produced to transfer a label from said supply to said article.

2. Apparatus as claimed in claim 1 wherein the sprocket is coaxial with said drum and of equal diameter to said drum.

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3. Apparatus as claimed in claim 1 wherein said stop means comprises two dogs and the stop means on the chain comprise spaced stop elements, one of said dogs cooperating with an adjacent stop element of the chain upon movement of said movable base in one direction to cause rotation of said label applying drum and the other of said dogs cooperating with an adjacent stop element of said chain to produce rotation of said label applying drum upon movement of said movable base in the opposite direction.

4. Apparatus as claimed in claim 3 in which said dogs are shiftable between operative and inoperative positions and including spring means urging said dogs to said operative position.

5. Apparatus as claimed in claim 1 in which said means for producing reciprocal movement of said movable base comprises a double acting piston and cylinder.

6. Apparatus as claimed in claim 1 including means for pressing a label against a surface of said item to be labelled said means being movable in a direction normal to the axis of rotation of said drum whereby a label can be applied to adjacent surfaces at a corner of an item to be labelled.

7. Apparatus as claimed in claim 6 including means sensing the arrival of an item at the labelling station and operable to control movement of said label pressing means.

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ALFRED L. LEAVITT, Primary Examiner

B. J. LEWRIS, Assistant Examiner

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