

[54] LABELLING DEVICE
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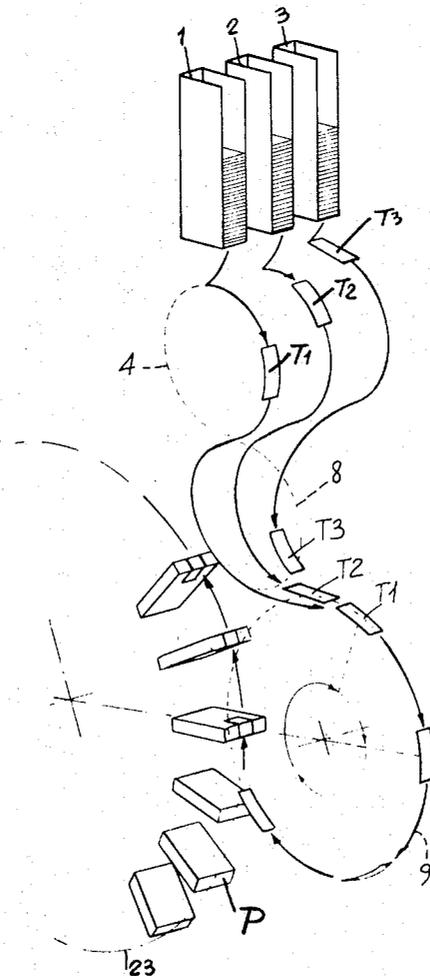
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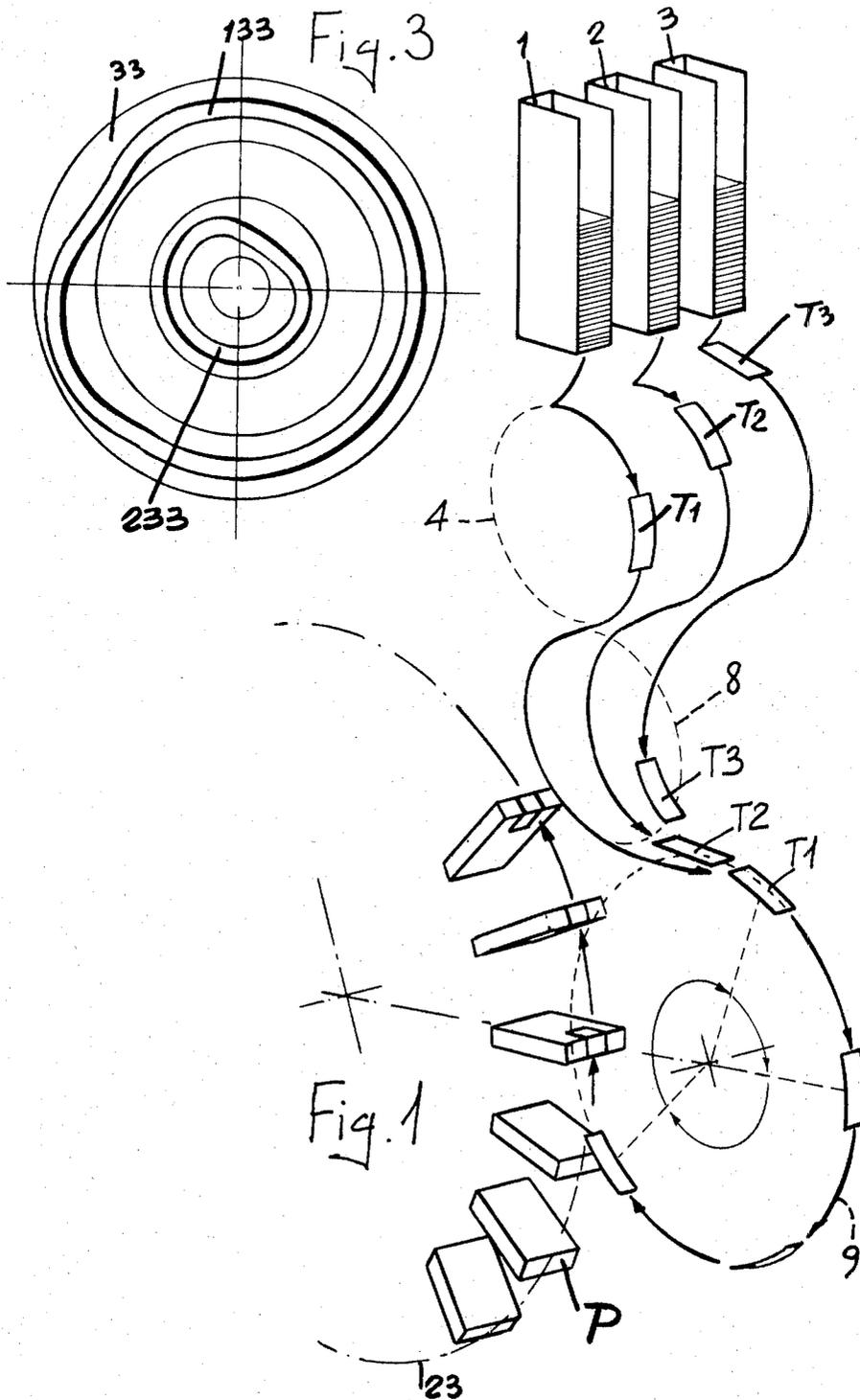
[57] ABSTRACT

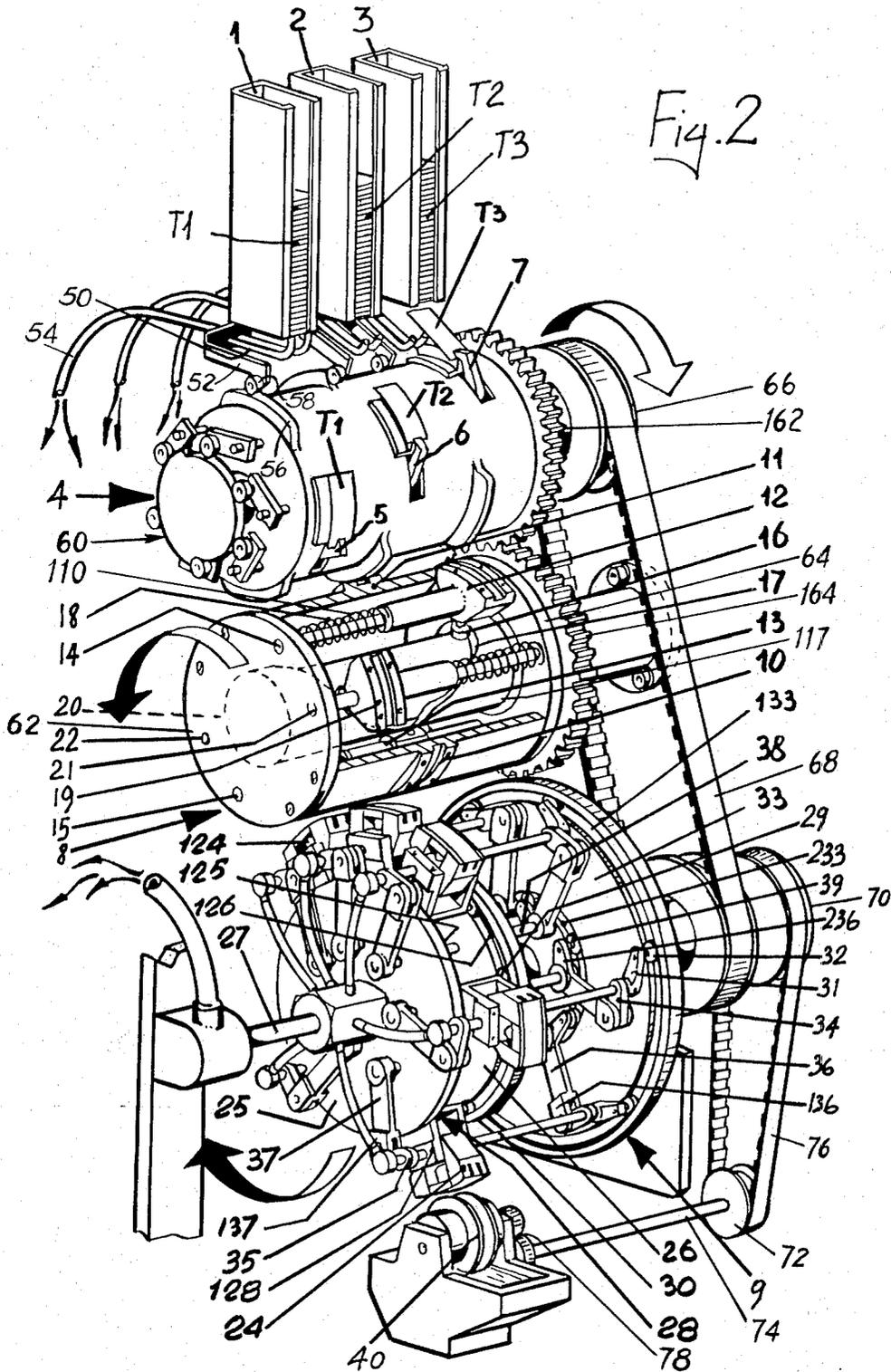
Apparatus for providing labels or the like at an application station, which comprises a plurality of label supply units mounted in spaced relationship with each other, means for withdrawing labels from the supply units, means for placing the labels withdrawn from the spaced supply units in alignment with each other, and means for receiving the aligned labels and delivering them seriatim to an application station.

[56] References Cited
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6 Claims, 3 Drawing Figures







LABELLING DEVICE

BACKGROUND

This invention relates to apparatus for placing labels on packages and more particularly to apparatus for removing a label or stamp from a supply thereof and placing it on a cigarette package or the like.

The packages to which the stamps or labels are applied are passed through an application station at a rate predetermined by the production rate of the machine producing the packages and, obviously, the stamps or labels must be fed to the station by the apparatus at the same rate and also in synchronization with the passage of the objects through the station.

In the past, such apparatus, called labelling devices, involved merely the removal, usually by suction means, of a stamp or label from the bottom of a stack thereof contained in a hopper by picking an edge thereof up to permit a rotary device to slide the label out of the hopper and deliver it to eventually to the application station of the apparatus.

The use of this type of device is limited in speed in that the number of labels which can be picked up from the same hopper in a unit of time cannot exceed a certain value beyond which picking irregularities are liable to occur. This limits the number of labels that can be applied to packages and, accordingly, the rate of production of the packages themselves.

SUMMARY

It is, accordingly, an object of this invention to provide an improved labelling device.

It is a further object of this invention to provide apparatus for taking labels from a plurality of supply sources and applying them seriatim to articles passing through an application station.

It is a still further object of this invention to provide apparatus for withdrawing articles such as labels from several spaced sources and place them in alignment with each other.

It is another object of this invention to provide apparatus for accepting labels from a source at one speed and applying them to articles moving at a different speed.

In accordance with these and other objects, a preferred embodiment of apparatus according to the invention may comprise a plurality of label supply units mounted in spaced relationship with each other, means for withdrawing labels from the supply units, means for placing the labels withdrawn from the spaced supply units in alignment with each other, and means for receiving the aligned labels and delivering them seriatim to an application station.

These and other features of the invention and the resulting advantages, will be understood from the following detailed description of a preferred embodiment, given as a non restrictive example, with reference to the attached drawings, in which:

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of the invention illustrating the operation of apparatus according to the invention in conjunction with a cigarette packaging machine.

FIG. 2 is a perspective view of a preferred embodiment of apparatus according to the invention.

FIG. 3 is an elevation view of a portion of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the attached drawings, a preferred embodiment of the invention comprises three hoppers designated 1, 2 and 3, mounted in a side by side relationship and containing stamp stacks T1, T2 and T3, respectively, a pick up drum 4 mounted beneath the three hoppers and including three pairs of grippers, designated 5, 6 and 7 respectively mounted on the periphery thereof, an aligning drum 8, which aligns the stamps in a single arcuate row and transfers them to a drum 9, which transports the stamps to the application station and applies them to the packs.

More specifically, the grippers are mounted on pickup drum 4 in a staggered arrangement wherein the two grippers of each pair are mounted 180° apart on the drum and the three pairs are radially offset 60° from each other and displaced laterally along the periphery of the drum so as to be in spaced relationship with the three hoppers.

The removal of the bottommost stamp for each of the stacks is facilitated by a pair of suction nozzles 50 mounted on a housing 52 for pivotal movement toward and away from the leading edge of each of the hoppers. The nozzles are connected to a source of suction through hoses 54 and are moved into stamp engaging position by cams 56 mounted on the periphery of the drum in advance of each of the grippers. A cam follower 58 is mounted on each of the housings 52 in spaced relationship with the cams 56 and ride up on thereon to urge the nozzles 50 into stamp engaging position. When the cam followers ride off the cams 56 the suction nozzles move leading edge of the bottommost stamp into position to be gripped by one of the grippers. The grippers are operated in a conventional manner by a cam and lever arrangement 60.

The transfer drum 8 is mounted for rotary movement adjacent drum 4 and includes a pair of spaced end disks 62 and 64 and six suction sectors, designated 10, 11, 12, 13, 19 and 20. The six suction sectors are mounted equidistantly, in the radial sense, about the periphery of the drum and are offset from each other in the lateral sense in that suction sectors 10 and 11 are mounted in spaced relationship with the grippers 6 in the center of the drum periphery, suction sectors 12 and 13 are mounted in spaced relationship with the grippers 7 on the right hand side of the drum periphery, as seen in FIG. 2, and suction sectors 19 and 20 are mounted in spaced relationship with the grippers 5 on the left hand side of the drum periphery as seen in FIG. 2. The two sectors of each of these three groups are mounted 180° apart around the periphery of the drum 8, with each successive sector being radially spaced 60° around the periphery of the drum from its adjacent sector.

The center sectors 10 and 11 are fixedly mounted on the periphery of drum 8. The other sectors are mounted for slidable movement between positions spaced from their respective associated grippers to positions in alignment with the center sectors. For this purpose, the right hand suction sectors 12 and 13 are slidably mounted on shafts, designated 14 and 15 respectively, which are mounted between the two end disks of the drum and the left hand suction sectors 19 and 20 are slidably mounted on shafts, designated 21 and 22 respectively, which are also mounted between the ends of the drum. The sectors 12 and 13, and 19

and 20 are biased into their positions in alignment with the grippers 7 and 5 respectively by springs 110 and are moved into alignment with the center sectors by a cam surface 17 mounted on a cylindrical member 117 positioned in the interior of the drum.

Each of the movable sectors includes a cam follower 16 positioned on the cam surface 17. The cam surface is configured such that the movable sectors are positioned in alignment with the grippers at the interface between the drum 8 and the drum 4 and are in alignment with the center sectors at the interface with drum 9. Suction is applied to the respective sectors between the interfaces thereof with the drums 4 and 9 such that they pick up stamps from the grippers and transfer them to the drum 9.

The drum 9 is operable to pick up the stamps adhering to the suction sectors of drum 8 and applying them to cigarette packs P carried by packer drum 23. The drum 9 includes a pair of spaced disks 25 and 26 keyed to a shaft 27 and six carriages 28 mounted between the disks in a ring fashion. Each of the carriages includes a suction sector 24 for receiving and holding a stamp.

The two disks 25 and 26 are provided on their inside surfaces with identical circular tracks, designated 125 and 126 respectively, and each of the six carriages 28 is provided with two rollers 29, one of which is slidable in each of the tracks 125 and 126. The carriages 28 are driven by rotation of the disks 25 and 26. A non-linear component is added to the movement of the carriages 28 by a rod 30 affixed to each of the suction sectors 24 and engaged in the walls 128 of the respective carriages. A lever 31 is affixed to the right end (as seen in FIG. 2) of each rod 30, which lever carries a roller 32 which cooperates with a track 133 of a fixed cam 33 mounted in parallel spaced relationship with the disks 25 and 26. A link 34 is idly engaged to each rod 30 adjacent lever 31 while a link 35 is idly engaged to each rod 30 adjacent the other end thereof, on the other side of the carriage 28 associated therewith.

Link 34 is pivotally connected to a fork element 136 at the end of a lever 36. In a like manner, link 35 pivotally connected to a fork member 137 at the end of a lever 37. The other ends of levers 36 and 37 are hinged to the outside of disks 25 and 26 respectively.

Lever 36 includes an appendix 236 on which is rotatably mounted a roller 39 which is engaged in a cam track 233 provided in cam 33.

The profiles of tracks 133 and 233 and the linkage comprising levers 31, 36 and 37 and links 34 and 35 operate the movement of the carriages 28, and therefore of the suction sectors 24, in a non-linear fashion such that the pitch between the sectors 24 at the point of tangency between drum 9 and drum 8 is equal to the pitch of the suction sectors of drum 8 and the angular velocities of the suction sectors thereon and equal, while in the area of the point of tangency between drum 9 and drum 23 the pitch between the carriages 28 is equal to the pitch of packs P carried by drum 23 and the angular velocity thereof is equal to the higher angular velocity of the packs.

For the purpose of the application of the stamps to the packs each suction sector 24 has a cavity 124 having dimensions proportioned to those of the pack on which the stamp must be applied and the rotary paths of the drums 9 23 overlap slightly as shown in FIG. 1 so that each pack can enter a cavity 124, and thus cause the stamp to lie in a "U" fashion, that is, as a

rider, on the pack. Because of the penetration of pack P in cavity 124, it is necessary that each sector 25 accompanies the corresponding pack along a certain arc of rotation of drum 23. This is obtained by appropriately shaping tracks 133 and 233 of cam 33.

Before being applied to the packs, the stamps are smeared with glue by a roller 40.

The apparatus is driven by a motor (not shown) which drives the shaft of drum 4. Drum 8 is driven from drum 4 in the opposite sense by gears 162 and 164 mounted in meshing relationship on drums 4 and 8 respectively. Drum 9 is driven from drum 4 by a pulley 66 mounted to drum 4, a pulley mounted on shaft 27 and a belt 68 mounted thereover. The glue application wheel 40 is driven from shaft 27 by a pulley 70 mounted thereon, a pulley 72 mounted on a shaft 74 and a belt 76 mounted thereover. The rotation of shaft 74 is geared down by a gear arrangement 78 before being transmitted to the glue application wheel.

In operation, stamps are removed seriatim from the hoppers 1, 2 and 3 by the suction nozzles and the grippers on drum 4 and transferred seriatim to drum 8, where they are placed in arcuate alignment by the action of cam surface 17 on the suction sectors holding the stamps. The aligned stamps are then transferred to the arcuately aligned carriages 28, whereupon they are speeded up and applied to the packages P.

The advantages attendant this arrangement are manifest in that the rate of stamp delivery to the application station is no longer limited by the speed at which they may be removed from the hoppers because of the multi-hopper supply and the aligning drum. In addition, the stamp application rate is further increased by the provision of means to accelerate the stamps on their way to the application station.

Obviously, appropriate means, not illustrated, are provided, to interrupt the suction in the sectors of drum 8, in the area of the coordinating points where the stamps are transferred from these sectors to sectors 24 of drum 9, and also to interrupt the suction in sectors 24 after the stamps have been applied to the packs.

Many variants and changes can be provided to the above embodiment, without, however, departing from the principle of the invention, as explained in the foregoing and claimed hereunder. For example, while three hoppers are shown, the number is not limited to three since it is obvious that any reasonable number could be used within the scope of the invention by providing an aligning drum having fewer or additional movable suction sectors.

I claim

1. Apparatus for providing labels or the like at an application station, which comprises:

a plurality of label supply units mounted in spaced relationship with each other,

means for withdrawing labels from the supply units,

means for placing the labels withdrawn from the

spaced supply units in alignment with each other,

including a plurality of means for receiving labels

from the label withdrawing means, said means

being spaced from said supply units, means mount-

ing certain of the label receiving means for slidable

movement, and means sliding said certain of the

label receiving means into alignment with another

of said label receiving means, and

means for receiving the aligned labels and delivering

them seriatim to an application station.

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2. Apparatus according to claim 1, wherein the label supply units are hoppers containing stacks of labels, said labels being withdrawn from the bottom of the hopper.

3. Apparatus according to claim 1, wherein the label withdrawing means comprises:

a drum having pick-up units mounted on the periphery thereof,
means for rotating the drum,

suction means mounted for pivotal movement into and out of engagement with labels in the supply units to engage a label and partially withdraw it from the supply unit,

means for pivoting the suction means in a timed relationship with the rotation drum to cause labels to be partially removed from the hopper so as to be positioned to be engaged by the grippers on the drum.

4. Apparatus according to claim 1, wherein said means for receiving the aligned labels includes:

a plurality of label receiving means mounted for rotary motion, and

means connected to said label receiving means for increasing the angular velocity of the label receiving means along a portion of their travel.

5. Apparatus for providing labels or the like at one application station, which comprises:

a plurality of hoppers mounted in side by side relationship and containing stacks of labels, said hoppers being adapted to have labels withdrawn from an opening therein,

a first cylindrical member mounted adjacent said hoppers,

a plurality of label gripping units mounted on the first cylindrical member in spaced relationship with the hoppers and operable to withdraw labels from the hopper,

a label receiving and applying member mounted in spaced relationship with the first cylindrical member,

a second cylindrical member mounted between the first cylindrical member and the label receiving and applying member,

a plurality of label holding members mounted in laterally spaced positions along the periphery of the said second cylindrical member spaced from the

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label gripping units, said label holding members being radially offset from each other,

means mounting certain of said label holding members for slidable movement parallel to the axis of the cylindrical member, and

cam means for sliding said certain of the label holding members into alignment with another of said label holding members for transfer to the label receiving and applying means.

6. Apparatus for providing labels or the like at one application station, which comprises:

a plurality of hoppers mounted in side by side relationship and containing stacks of labels, said hoppers being adapted to have labels withdrawn from an opening therein,

means for withdrawing labels from each of the hoppers,

a label receiving and applying means mounted in spaced relationship with the label withdrawing means, said label receiving and applying means including a plurality of label receiving carriages mounted for sequential rotation through a common rotary path,

a cylindrical member mounted between the label withdrawing means and the label receiving and applying means,

a plurality of label holding members mounted in laterally spaced positions along the periphery of said cylindrical member spaced from the hoppers and adapted to receive labels that were withdrawn from the several hoppers by the label withdrawing means, said label holding members being radially offset from each other,

means mounting certain of said label holding members for slidable movement parallel to the axis of the cylindrical member,

cam means for sliding said certain of the label holding members into alignment with another of said label holding members and with the label receiving carriages of the label receiving and applying member for transfer to the latter, and

means for accelerating the rotary movement of the carriages upon the receipt thereon of labels from the label holding members of the second cylindrical member.

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