Sept. 25, 1956 W. WEILER 2,764,408

METHOD AND MEANS FOR WITHDRAWING LABELS FROM A STACK OF LABELS IN A LABELLING MACHINE

Filed June 23, 1953 2 Sheets-Sheet 1

Fig.1.

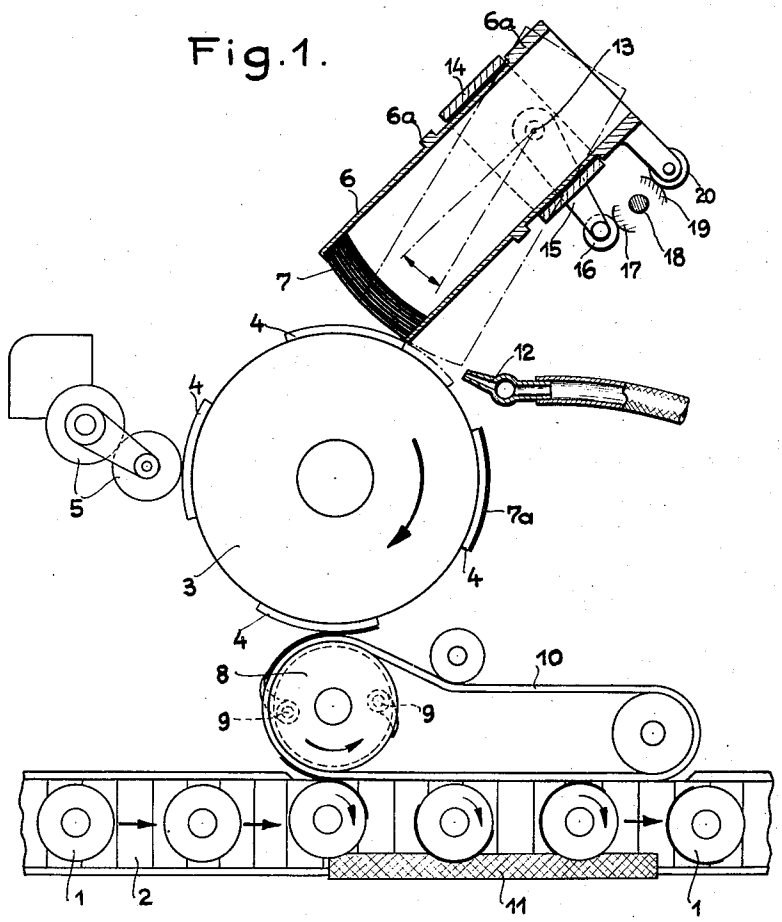
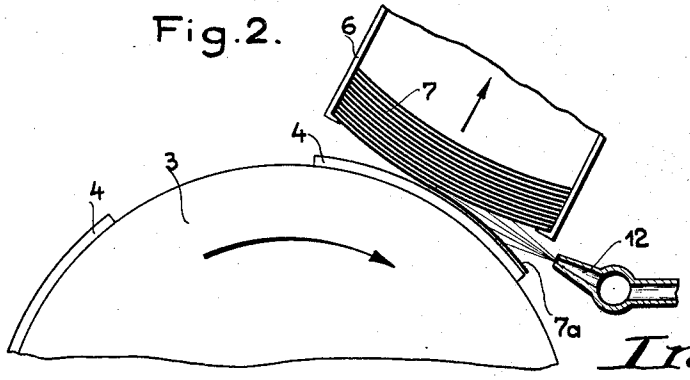


Fig.2.



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Fig.3.

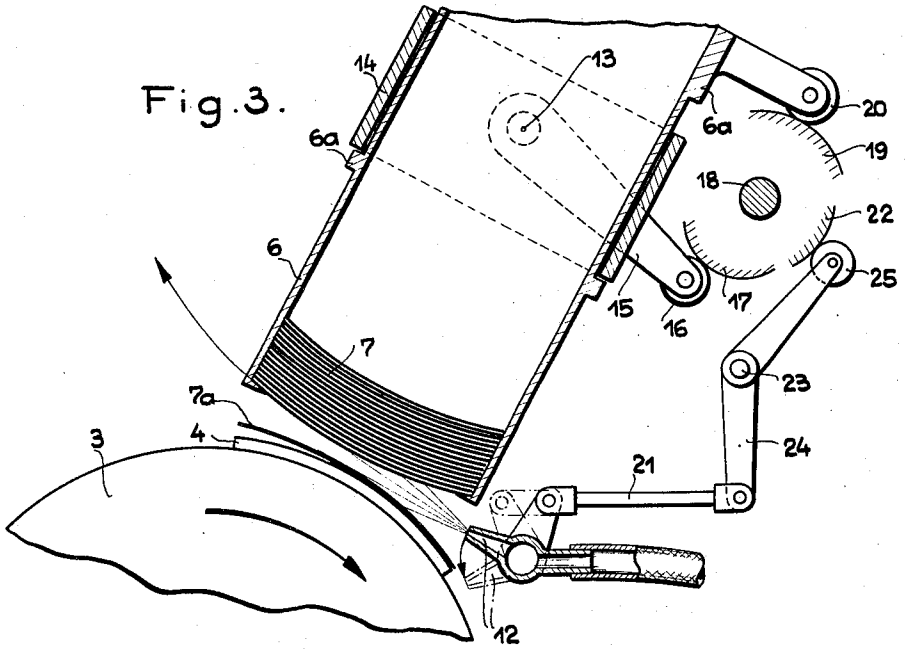
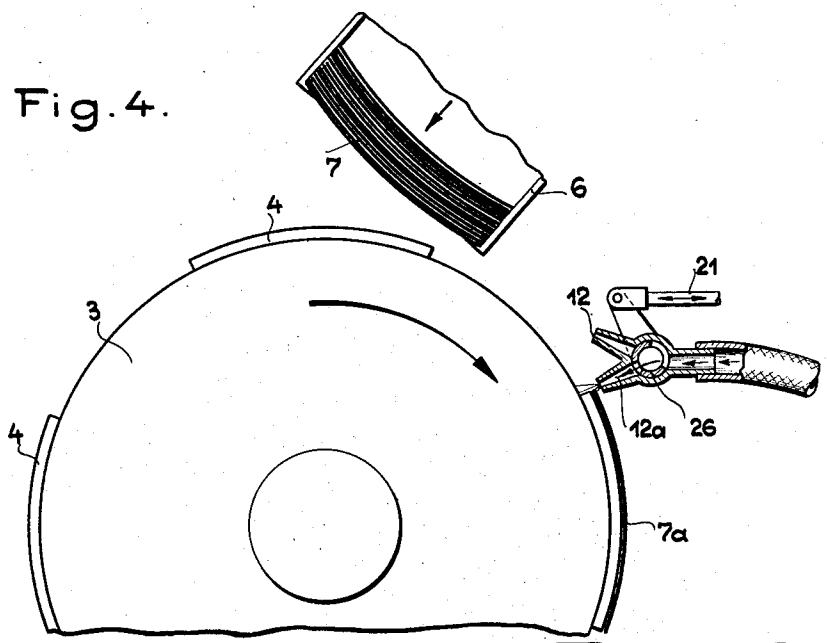


Fig.4.



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METHOD AND MEANS FOR WITHDRAWING LABELS FROM A STACK OF LABELS IN A LABELLING MACHINE

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Claims priority, application Germany July 1, 1952

6 Claims. (Cl. 271—33)

The present invention broadly relates to the art of labelling. More particularly this invention relates to method and means for withdrawing labels from a stack of labels in a labelling machine.

Specifically, this invention relates to method and means for withdrawing labels from a label magazine and applying these labels to a rotary adhesive applying cylinder from which the labels are transferred to articles to be labelled.

This application is a continuation in part of my prior filed and now abandoned application Serial No. 241,612, filed August 13, 1951, and entitled Machine for Labelling Bottles and Other Cylindrical Objects.

Specifically, this invention relates to a method and means for withdrawing labels from a label magazine in a labelling machine of the type in which a continuously rotating cylinder, provided with raised label receiving surfaces, moves successively past adhesive applying means which transfers adhesive to the raised surfaces then into the sphere of movement of a label magazine that moves tangentially with respect to the arcuate path of movement of the label receiving surfaces.

In known labelling machines of this type a continuously rotating cylinder is provided with raised glue receiving surfaces and which surfaces correspond substantially in size to the size of the labels. In the rotary motion of this cylinder the adhesive will be applied to the raised surfaces and upon subsequent motion these surfaces will pass into the range of a stack of labels in a label magazine in order that the end label in the stack can be removed therefrom by engagement with the glue upon the raised glue receiving surfaces. Usually at a further moment of the arcuate path of movement of the raised surface the label will be removed from the raised surface to be transferred to the article or object to be labelled.

The foremost label is removed from the stack and transferred to the raised gluing surface by the rolling contact in a tangential direction with reference to the arcuate path of movement of the raised surfaces with the label magazine moving to and fro in either a straight line direction or in an arcuate path. The label magazine will have to follow the path of the raised glue containing surface until the rearmost or limiting back edge of the magazine is in the plane of the glued surface in order to press the rear end of the label against the glued surface before the label magazine attains a slight clearance with respect to the path of movement of the glue containing surface and is moved back to its initial position.

It is believed clear that this movement of the label magazine over a relatively long path of travel is necessary for a trouble-free transfer of the label to the label receiving surface, as well as for uniform application of adhesive and requires, in order to maintain a quick or rapid labelling sequence, an accelerated return motion of the labelling magazine to its initial position. This is particularly true when working with large labels which necessitates a correspondingly increased length of working

stroke of the label magazine and thus the output of this type labelling machine is limited in consequence of a quick reciprocating motion resulting from acceleration and retardation of the label magazine.

It is therefore an object of this invention to alleviate the aforementioned drawbacks by removing any limitations on the output of the labelling machine.

The invention further has for an object to provide a method in which the forward travel of the label magazine occurring jointly with the rotating motion of the raised label receiving surfaces will be interrupted after the conjoint action of raised surface and label magazine has only partially detached the end label from the stack, whereupon the portion of the label which still remains in the stack will be completely removed therefrom and pressed against the raised surface simultaneously with the return of the label magazine to its initial position by a jet of air directed against the forward motion of the label to be removed and entering the gap formed between the label that is partly detached and the next adjacent label that remains in the stack.

It is therefore clear that this mode of operation, which can be utilized in label machines of the aforementioned type in which the labels are removed by raised adhesive carrying surfaces, is also operable in arrangements in which the labels will be initially detached from a stack by means of suction surfaces and this invention has for an object to provide a method of withdrawing labels in which the stroke of movement of the label magazine will be reduced, for instance, by one-half the length of the label. It follows that from this mode of operation there will be sufficient time, even when working with relatively long or large labels, to move the label magazine to and fro it its movement with a speed that can correspond to the labelling speed of the particular machine.

It is therefore a further specific object to carry out the aforementioned method of removing the end label from a stack by providing a blowing nozzle in the range of the foremost or forward limit of stroke of movement of the label magazine and with this nozzle being directed against the forward motion of the adhesive carrying surface or other surface to receive the label and subjacent the label magazine. The nozzle is preferably provided with a slot shaped discharge orifice of such width as to extend over the total width of the label. It is of course obvious that the nozzle can constitute a plurality of individual nozzles arranged directly adjacent to one another and in number and distribution such as to extend over the label.

It is a further object to provide, in connection with the nozzles, means for mounting the same for rotation in order to increase their efficiency so that, in the sequence of operations of transferring labels, the nozzle will occupy its most favorable position for initially detaching the label from the stack and subsequently it will be moved into a position so as to facilitate pressing of the label against the raised glue containing surface.

It is a further specific object to provide the immediately aforementioned result by incorporating stationary nozzles or two series of stationary nozzles, each series directed according to the particular function the air jet is to accomplish, namely initially completing the removal of the label from the stack and thereafter pressing the label against the surface as the surface moves past the nozzle, with suitable valve means to control the issuance of air from the nozzles or series of nozzles.

Further and more specific objects will be apparent from the accompanying drawings, in which:

Figure 1 illustrates diagrammatically the position of a blowing nozzle in a labelling machine at that position of movement of the components of the labelling machine in which the stack of labels has assumed its posterior in-

itial position at the commencement of the joint forward motion of the label magazine and the rotary cylinder having the raised adhesively coated label receiving surfaces thereon,

Figure 2 is a similar fragmentary view illustrating the final position of the stack of labels after the end label has been partially detached from the stack and with the stationary blowing nozzle or jet nozzle illustrated in operation,

Figure 3 illustrates diagrammatically the position in which the label stack has been lifted or moved away from the raised label receiving surface and the initiation of its retrograde movement to initial position and with the further illustration of a movable nozzle for directing the jet of air initially to remove the label from the stack and subsequently to press the label upon the label receiving surface,

Figure 4 illustrates the label magazine at the end of its retrograde or return stroke with the next adjacent label receiving surface moving into position to receive subsequent label and a modified showing of air jet arrangement.

In order to illustrate the invention, it is disclosed in conjunction with a labelling machine for transferring labels to bottles or the like cylindrical articles **1**, which move forward on a continuously moving plate-chain conveyor **2**, which transfers the bottles in an upright condition to and past a label applying station and at which station is embodied a movable label magazine **6**, a continuously rotatable adhesive applying cylinder **3** having raised glue receiving surfaces **4** spaced about the periphery thereof. These glue receiving surfaces pass into contact with adhesive applying means denoted at **5** and these surfaces generally correspond in size of the labels **7** that are in the magazine **6**. During the movement of the glued or adhesively coated label receiving surface **4** coming into contact with the end label **7***a* of the stack, as shown initially in Figure 1 and subsequently in Figure 2, the end label will be withdrawn from the stack or magazine and will adhere to the surface **4**. In further sequence of movement, in effecting a labelling operation, the labels will be removed from the surfaces **4** by a continuously rotating transfer mechanism indicated diagrammatically at **8** and including grippers **9** and an endless belt **10**, which remove the labels from the raised surfaces **4**, carry them around and press them against the bottles or objects to be labelled and, while simultaneously exerting pressure against the label and the article over a substantial vertical extent thereof, simultaneously rotate the successive articles about their own axes along a backing member **11** to properly apply the label to the articles as they move past the transfer mechanism.

In carrying the present invention into effect, the movements of the reciprocating label mechanism **6** are so controlled that its forward motion is preformed with each end label **7***a* coming into successive contact with the raised surfaces **4** and the return motion of the label magazine is performed in a position somewhat lifted or removed from the arcuate path of movement of the surfaces **4**. Commencing with the position shown in Figure 1, the label magazine **6** moves forward in synchronism with the peripheral speed of the raised surface **4** and jointly with the movement of this surface and as the end label comes in contact with the adhesive on the surface **4** it is partially removed therefrom as exemplified by the position of label **7***a* in Figure 2, with Figure 2 further illustrating the forward limit of stroke of the label magazine. With the interruption of this forward stroke of the magazine **6** and simultaneous slight movement of the magazine away from the path of movement of the surface **4**, a jet of air is projected from the nozzle **12** as shown in Figure 2 and which nozzle is so positioned that a jet is directed between the top surface of the end label **7***a* and the under surface of the next label in the stack so that the jet of air completely removes the label from the stack and the jet further pressing the label completely against the raised surface **4**. Simultaneously the return motion of the magazine **6** to its initial position is effected, that is to the position occupied in Figure 4, and thus the magazine is again in position for conjoint action with the next raised surface **4** since at the completion of the retrograde stroke of the label magazine to initial position it is again moved slightly toward the arcuate path of movement of the raised surfaces. As said before, the tangential movement of the label magazine **6** is synchronised with a forward and backward movement along its longitudinal axis. The label magazine **6** is therefore mounted on a guiding channel **14** pivoting on the fixed point **13**. The lever **15**, which also pivots on the point **13**, is connected with the guiding channel **14** on one end while on the other it carries the roll **16** through which the lever **15** is operated by the cam **17** on the rotating shaft **18**. The forward and backward movement of the label magazine **6** along its longitudinal axis in the guiding channel **14** is limited by the stops **6***a* on the wall of the label magazine **6** and it is controlled by another cam **19** also fitted on the shaft **18** which contacts the roll **20** on the label magazine **6**. Figure 1 illustrates in dotted lines the forward limit of stroke of movement of the label magazine.

It is therefore believed clear that the present invention provides a method of withdrawing labels from the label magazine of a labelling machine which consists in the steps of continuously moving adhesive coated surfaces in an arcuate path past a label magazine containing a stack of labels while moving the stack to and fro at least tangentially of the path of movement of the surfaces so that during the simultaneous forward motion of stack and surfaces the end label of the stack adheres to a surface and is partially removed from the stack. The next step is the interruption of the forward motion of the stack by moving the same way from the surface whereupon a jet of air is blown between the partially withdrawn label and the next succeeding label and which jet is continuously directed on to the label while the surface continues its movement and the stack is returned to its initial position so that the completion of the withdrawal of the end label is effected by the jet and the jet of air simultaneously, with completion of withdrawal, presses the label against the surface.

In connection with the specific means to accomplish the completion of withdrawal or removal of labels from the stack, the nozzle through which the jet issues may be rotatably mounted for swinging movement about a stationary axis as shown in Figure 3. A connecting rod **21** is suitably attached to the nozzle so that with the nozzle directed as in full lines in Figure 3 the label is completely detached from the magazine by an air jet which is tangentially directed with regard to the arcuate path of movement of the surfaces **4**, whereupon as the surface with the label adhering thereto continues its movement downwardly as in Figure 3, connecting rod **21** is moved to the right and the nozzle **12** is swung into the dotted line position so that the jet of air is directed normal to the raised surface and the label thereon as surface and label pass the jet and under which conditions the jet of air constitutes pressure applying means with particular reference to pressing the rear end of the label against the raised surface **4** as clearly indicated in Figure 4. The movement of the pivoting nozzle **12** is controlled by the cam **22** on the shaft **18**. The lever **24**, turning on the fixed pivot **23**, is actuated by the cam **22** through the roll **25** fitted to one lever arm while the other lever arm actuates the rod **21** thus controlling the movement of the nozzle **12**.

Figure 4 shows a modification in which the jet of air is selectively directed through branches of a double nozzle **12**, **12***a*, which are stationarily mounted, with the nozzle **12** directed tangentially of the arcuate path of movement of the raised surface **4** and the nozzle **12***a* directed sub-

stantially vertically toward the raised surfaces as they move past the same. The nozzle **12** completing the detaching of the label from the magazine and the nozzle **12***a* functioning to complete the pressing of the label on to the raised surface **4** with particular reference to the rearmost edge of the label. Suitable valve means **26** are embodied in the common throat of the nozzles **12**, **12***a* to control the direction of flow of the jet through the respective nozzles in coordination with the movement of the cylinder **3** and thus the movement of the raised surfaces **4** past the nozzles. In that case the twin nozzle **12**, **12***a* is arranged stationary while the valve **26** within the nozzle can be arranged to operate nozzle **12** and **12***a* alternatively. The movement of the valve **26** can be controlled by rod **21** and lever **24** as shown in Figure 3.

What is claimed is:

1. Means for withdrawing labels from a stack of labels in a labelling machine, including a label receiving surface adapted to be adhesively coated and means mounting the same for movement in an arcuate path, a label magazine having a stack of labels therein supported with the undersurface of the end label exposed, means for moving the magazine in a to and fro path tangentially of and at least closely adjacent the path of movement of the surface so that upon simultaneous movement of magazine and surface the adhesive on the surface contacts the end label of the stack and partially withdraws the same from the stack, air jet means directed against the path of movement of surface and stack and positioned to direct a current of air tangentially of the path of movement of the stack between the partially removed label and the next succeeding label in the stack so that the air will complete the withdrawal of the label from the magazine, the air jet means constituting at least one air nozzle, means mounting the same for rotation about an axis parallel with the axis of movement of the surfaces, and means for rotating the nozzle between a range of positions constituted by a first position in which the nozzle is directed tangentially of the path of movement of the surface so as to complete removal of the label and a second position in which the nozzle is directed substantially normal to said path of movement so that as the surface with the label thereon moves past the nozzle in the said second position the air jet passes over the entire surface of the label to insure complete adherence thereof to the surface.

2. Means for withdrawing labels from a stack of labels in a labelling machine as, including a label receiving surface adapted to be adhesively coated and means mounting the same for movement in an arcuate path, a label magazine having a stack of labels therein supported with the undersurface of the end label exposed, means for moving the magazine in a to and fro path tangentially of and at least closely adjacent the path of movement of the surface so that upon simultaneous movement of magazine and surface the adhesive on the surface contacts the end label of the stack and partially withdraws the same from the stack, air jet means directed against the path of movement of surface and stack and positioned to direct a current of air tangentially of the path of movement of the stack between the partially removed label and the next succeeding label in the stack so that the air will complete the withdrawal of the label from the magazine, the air jet means including two nozzles, one directed substantially tangentially of the path of movement of the surfaces so as to complete the withdrawal of the label from the stack and the other directed substantially normal to the path of movement, and means for controlling the issuance of air from the respective nozzles so that the complete withdrawal of the label is effected by one nozzle and the completion of the pressing of the label against the surface is effected by the second nozzle.

3. In a labelling machine, means for withdrawing labels from a stack and simultaneously adhesively coating the same comprising a rotary label receiving surface, means for adhesively coating the surface, a label magazine having a stack of labels supported therein with the undersurface of the end label exposed, means for supporting the magazine for swinging movement about an axis parallel to the axis of the surface and disposed in the path of movement of the surface subsequent to the means for adhesively coating the surface, means independent of the surface for moving the magazine from its initial position in a to and fro path tangentially of and initially at least closely adjacent the path of movement of the surface so that upon simultaneous movement of the magazine and surface the adhesive on the surface contacts the end label of the stack and partially withdraws the same from the stack, said last-mentioned means including means for interrupting the movement of the magazine and withdrawing it away from its initial path of movement after the end label is only partially adhered to the surface and means for directing at least one jet of air against the partially removed label, including means for changing the direction of flow of the air from a path tangentially of the path of movement of the stack and surface to a path directed substantially normal to the path of movement of the surface so that as the surface with the label thereon moves past the means for directing the jet of air, the entire surface of the label is impinged upon by the jet of air to insure complete adherence of the label to the moving surface.

4. Means for withdrawing labels from a stack of labels in a labelling machine as defined in and by claim 3 in which the means for moving the magazine to and fro tangentially of the path of movement of the label receiving surface includes a guide channel for receiving the magazine and means for swinging the guide channel and thus the magazine to and fro tangentially of the said surface.

5. Means for withdrawing labels from a stack of labels in a labelling machine as defined in and by claim 4 in which the magazine is slidably mounted in the guide channel for reciprocation therein, means is provided for limiting the reciprocatory movement of the magazine in the guide channel and means is also provided for reciprocating the magazine in the channel.

6. Means for withdrawing labels from a stack of labels in a labelling machine as claimed in claim 5 in which the means for reciprocating the magazine in the channel and the means for swinging the channel and thus the magazine include cam means.

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