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54 **Turret type labeling machine.**

57 Turret type labeling machine in which labels (1,2) are picked up by a rotating vacuum drum (11) at a label receiving station, holding the label on its cylindrical surface by vacuum while transporting it to a label applying station and releasing the label to a container (15) at a label applying station. A turret type of container transport is provided which rotates about an axis parallel to the vacuum drum axis and which has pairs of chucks (16) which rotate orbitally with the turret, each pair of chucks, in turn, clamping a cylindrical container between them and causing each container to come into tangent contact with a label on the vacuum drum at the label applying station. The vacuum drum and the turret move in the same rotational direction, e.g. clockwise as viewed from above. The chucks and containers are caused to spin about their individual axis, in the opposite rotational direction, e.g. counterclockwise as viewed from above. By this means each container and the label that is being applied to it move in a direction such that the label does not interfere, e.g. tangle with the next container. Therefore the pairs of chucks and containers can be packed more closely

together and/or containers of larger diameter can be efficiently labeled.

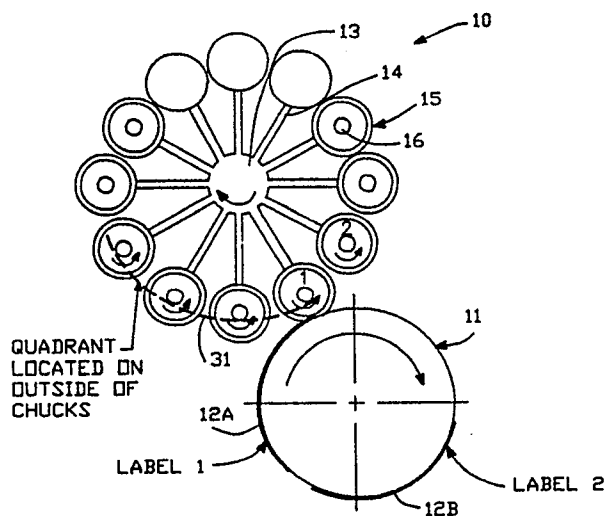


FIG.-1

EP 0 368 505 A1

TURRET TYPE LABELING MACHINE

This invention relates to a turret type of labeling machine.

In Hoffmann U.S. Patent No. 4,108,709 (hereinafter referred to as the '709 Patent) there is described a labeling machine of the turret type in which containers are supplied in sequence to a rotating turret which carries a number of pairs of vertically aligned chucks. Each container is deposited on the lower of a pair of chucks; the chucks are brought closer together to clamp the container in place and one of the chucks is driven (the other being free to rotate); the container so clamped between a pair of chucks and in vertical position is rotated about the main axis of the turret (referred to as orbital motion) and during its travel is brought into tangent contact with a label on a vacuum drum which is adhered to the container by an adhesive. The driven chuck is caused to rotate thereby spinning the container to wrap the label about it. By this means it is possible to carry out labeling at a high speed and to bunch the containers close together without a label from one container interfering with the labeling of the next following container.

It is an object of the present invention to provide improvements on the turret labeling machine of the '709 Patent.

It is a particular object of the present invention to so modify the construction and mode of operation of the machine of the '709 Patent as to allow containers to be placed more closely together and/or to allow containers of larger diameter to be labeled without interference between the label being applied to one container and the next following container.

The above and other objects of the invention will be apparent from the ensuing description and the appended claims.

The invention is illustrated by way of example in the accompanying drawings, in which

Figure 1 is a top plan view of the labeling machine showing a label at the commencement of application to a container;

Figure 2 is a view similar to Figure 1 but showing the label referred to in the description of Figure 1 at a later stage of application; and

Figure 3 is a fragmentary view in elevation of a container supported on the lower of a pair of chucks and with an arcuate belt which contacts the shaft of the lower chuck and causes the container to spin.

Referring now to Figure 1 the turret is indicated by the reference numeral 10 and a vacuum drum is indicated by the reference numeral 11. Two labels 12A and 12B are shown on the vacuum drum.

It will be understood that labels are supplied

continuously from a roll (not shown) and are cut from a continuous length of label stock by suitable label feed cutting mechanisms such as that shown in U.S. Patents Nos. 4,500,386; 4,188,843 and 4,108,711; that glue or solvent is applied to each label at its leading and trailing ends; that vacuum is applied to hold each label on the cylindrical surface of the drum and that such vacuum is released to release each label to a container, suitable mechanisms being well known in the art. It will also be understood that pre-cut labels may be used and extracted one by one from a stack rather than employing a continuous roll of labels.

In the embodiment of the invention illustrated the turret 10 rotates with a vertical shaft 13 having spokes 17 extending radially outwardly therefrom and which hold chucks 15 each of which is free to spin about the axis of its shaft 16. The vacuum drum 11 rotates clockwise as indicated by the arrow, the turret 10 rotates clockwise as indicated by the arrow and each chuck 15 is caused to spin counterclockwise. It will be understood that "clockwise" and "counterclockwise" refer to a view from above.

Referring now to Figure 3 a container 25 is there shown resting on a lower chuck 26 which is in alignment with one of the upper chucks 15. The chuck 26 is mounted at the end of a lower spoke 27 radiating from and fixed to the main shaft 13, such chuck having a shaft 28 rotatable in the spoke 27 and having a segment 29 of larger diameter and a segment 30 of smaller diameter. A belt or pad 31 is shown which is also shown in dotted lines in Figures 1 and 2. By shifting the belt from the larger diameter segment 29 to the smaller diameter segment 30 the speed of rotation of the chuck may be increased and by shifting it from the smaller diameter segment 30 to the larger diameter segment 29 the speed of spinning may be decreased.

The belt 31 is sufficiently flexible that it can be stretched about the shaft segments 29 or 30 but it is stiff enough and is of a texture such that it will spin the shafts 28. The ends of the belt 31 may be secured by suitable fasteners (not shown) to the frame of the machine so that it can be loosened, shifted from one shaft segment to the other and then tightened.

Instead of a belt drive such as shown in Figure 3, a pad may be used such as shown at 87 in Figure 2 of U.S. Patent No. 4,108,709 but on the outside of the wheel 85, such pad being concave toward the wheel, and such a drive may drive either the upper chucks 15 (see Figure 1) or the lower chucks 26 (see Figure 3).

Referring again to Figures 1 and 2, as label

12B approaches the point of application to the container 2 the preceding label 12A will have been completely or nearly completely wrapped around the container 1, hence will not interfere with labeling of the container 2. Also, container 1 and label 12A are moved away from vacuum drum 11. By reason of this, pairs of chucks 15 and 26 may be packed closely together and larger diameter containers (which require longer labels) may be labeled more efficiently.

It will be apparent that a suitable container infeed such as a star wheel and a suitable container outfeed such as another star wheel may be employed to supply unlabeled containers to the turret and to remove labeled containers therefrom. Means such as shown in the '709 Patent may be employed for this purpose.

It will therefore be apparent that a new and improved labeling machine has been provided.

Claims

1. In a turret type labeling machine comprising a cylindrical vacuum drum rotating about its cylinder axis and adapted to receive labels in succession on its cylindrical surface, to hold each label on its cylindrical surface while transporting it from a label receiving station to a label applying station and to release it at the label applying station, and a container transport in the form of a turret rotating about an axis parallel to the cylinder axis of the vacuum drum and carrying a plurality of pairs of chucks for orbital rotation about the turret axis, the chucks being arranged in pairs, each pair being in axial alignment and adapted to grip between them a cylindrical container and to cause the container so held to travel through a circular path about the turret axis and at one point in such path to be tangent to a label on the vacuum drum, the improvement which comprises:

means for rotating the turret about its turret axis in the same rotational direction as the vacuum drum and

means for spinning each pair of chucks with a container clamped between them in the opposite rotational direction

whereby each label, as it is being wrapped around a container, is moved in a direction to avoid contact with the next container.

2. The labeling machine of Claim 1 wherein the pairs of chucks are packed closely together.

3. A method of applying labels to containers comprising the steps of:

(a) transporting labels on the cylindrical surface of a rotating vacuum drum from a label receiving station to a label applying station, and releasing each label to a container at the label applying

station,

(b) transporting cylindrical containers by moving them through a circular path which is tangent to the vacuum drum at the label applying station,

(c) meanwhile causing each container, during such transport, at the time of such tangent contact and thereafter to spin about its cylinder axis and

(d) causing the vacuum drum to rotate in the same rotational direction and the containers to spin in the opposite rotational direction with respect to the direction of transport of the containers.

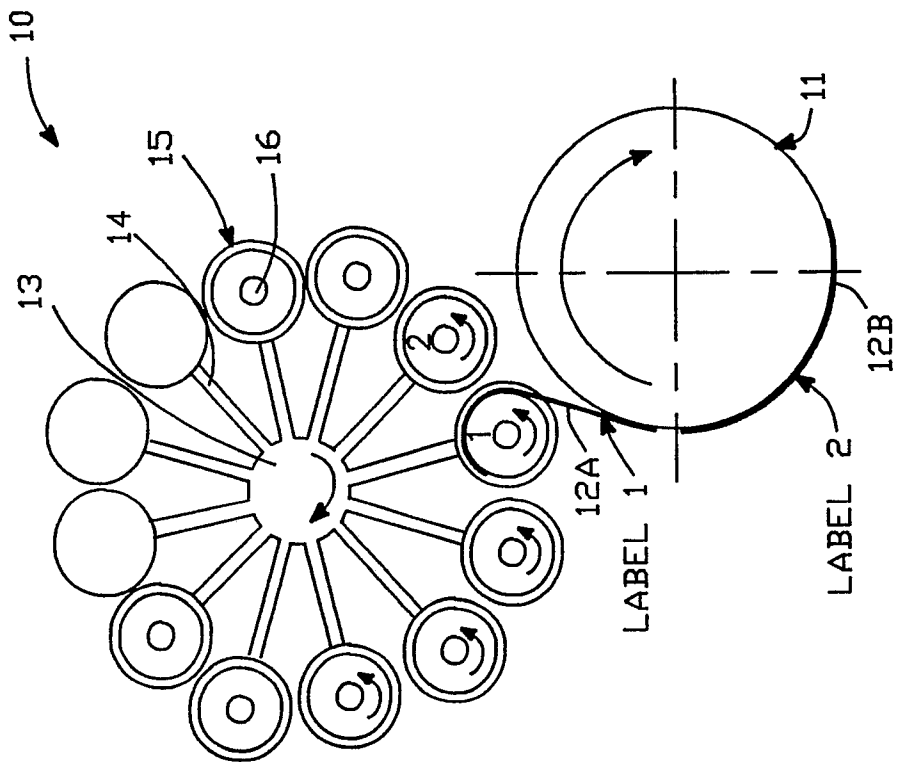


FIG.-2

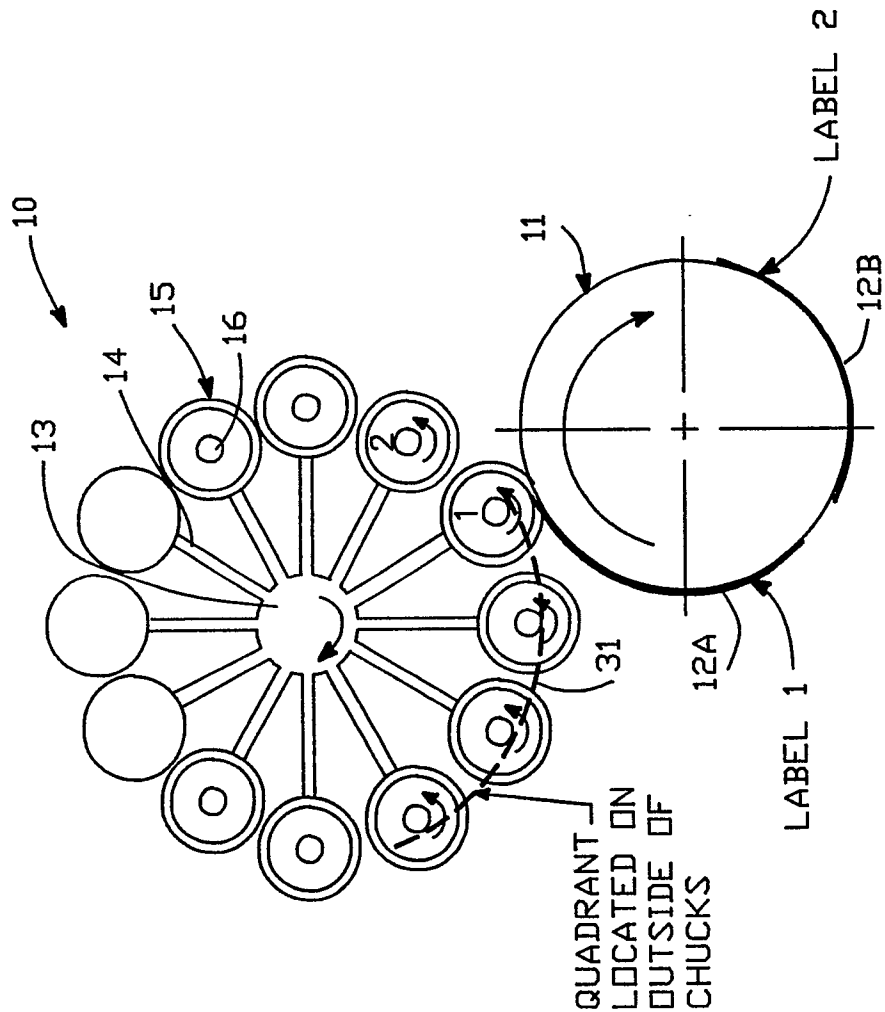


FIG.-1

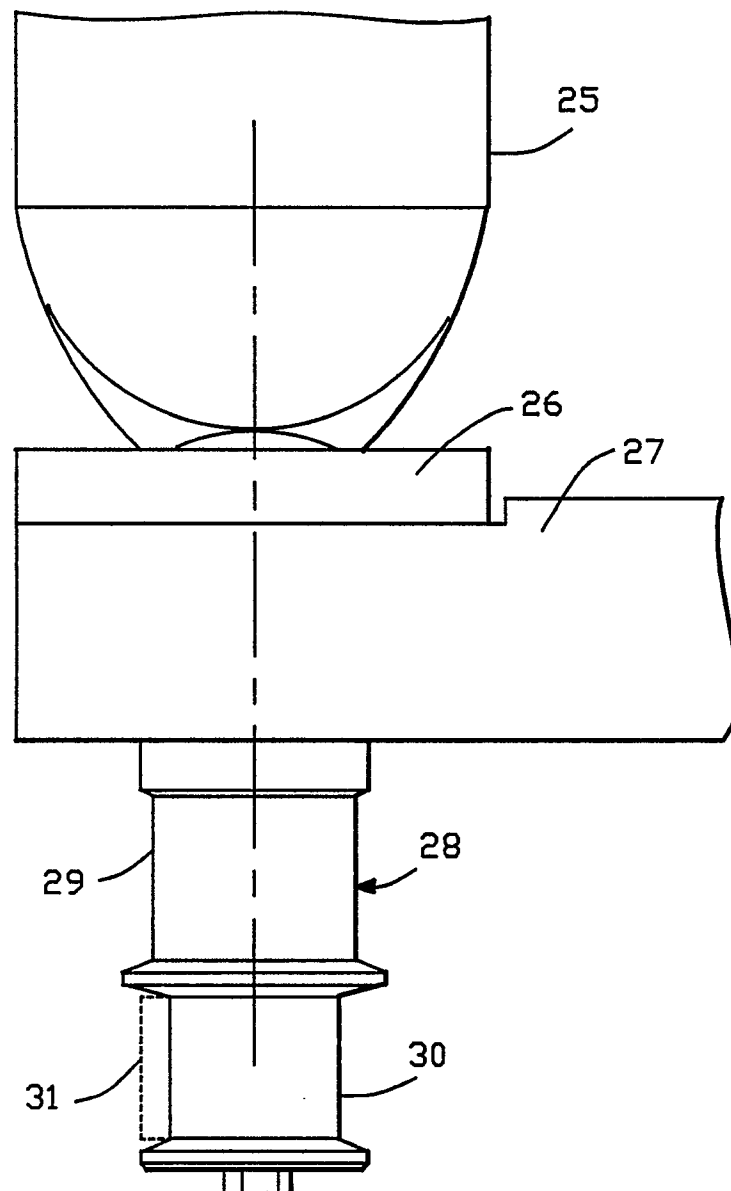


FIG.-3



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,Y	DE-A-2 726 822 (BEH. MANUFACT.) * Figures 1,2; page 6, lines 5-29; page 8, line 16 - page 9, line 4 * & US-A-4 108 709 ---	1-3	B 65 C 3/16 B 65 C 9/04
Y	DE-A-2 518 981 (STRUNK & CO.) * Figures 1-3; page 5 * ---	1-3	
Y	PATENT ABSTRACTS OF JAPAN, vol. 9, no. 80 (M-370) page 1803, 10th April 1985; & JP-A-59 209 823 (YASUMURO)	2	
X	IDEM ---	3	
P,A	US-A-4 806 197 (HARVEY) ---		
A	EP-A-0 095 882 (BEH. MANUFACT.) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22-01-1990	Examiner DEUTSCH J.P.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	