

- (21) Application No. 40795/76 (22) Filed 1 Oct. 1976
 (31) Convention Application No. 7 530 320
 (32) Filed 3 Oct. 1975 in
 (33) France (FR)
 (44) Complete Specification published 30 April 1980
 (51) INT CL³ B65C 9/32, 9/42
 (52) Index at acceptance B8F 11A 1C



(54) APPARATUS FOR LABELLING OBJECTS OF DIFFERING SHAPES

(71) I, JEAN YVES PERRET, of French Nationality, of Domaine de Sou lance, Martres-Tolosane, Haute-Garonne, France do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to automatic labelling devices for labelling objects of various shapes. It is especially useful for applying printed information to fruits.

It is known to affix to fruits self-adhesive labels, or to print an indication of origin, or a mark, by means of an inking pad, on fruits having at least a certain degree of hardness on the outside, such as oranges.

Another solution to labelling fruit consists in wrapping the individual pieces of fruit in a piece of paper. So far these labels have been put on by hand, which on the one hand considerably limits the length of the message carried by the fruit, and on the other hand is manifestly uneconomical, considering the cost of the labour involved.

Machines have been proposed which permit fruits to be sized or weighed, and transported after this sorting operation, into cases, crates or boxes. In such sorting and conveying machines the fruits are, in general, at some point *en route*, presented one by one in such a manner that they can either be individually weighed or sized.

The labelling of fruit poses an especial problem because, on the one hand, they are usually of irregular shape, and on the other hand, they must be handled without substantial knocking so as to avoid bruising.

The present invention is concerned with the provision of a device which will automatically label fruits being advanced through a sorting and transporting machine, such as described above, and which may, for example, be disposed above a conveyor belt on a part of the route where the fruits pass in a line.

The invention provides apparatus for labelling objects of various shapes comprising a label applicator having a set of rollers,

means for conveying objects to be labelled to the label applicator, a further set of rollers for pressing objects in turn against the rollers of the label applicator and means for supplying labels to the side of the rollers of the applicator against which, in use, the objects are pressed by the pressing rollers, wherein the two sets of rollers define between them a convergent pathway for the objects and the rollers of the label applicator are resiliently displaceable by an object in a direction away from the pressing rollers.

The automatic labelling device, which can be conveniently mounted on a conveyor belt on which objects of differing shape having a low degree of hardness are moved along one after the other, is advantageously provided with means for pre-regulating the width between the pressing rollers and the label applicator, and also means for detecting the entry of an object into the device.

The apparatus of the invention thus permits any reference to be imprinted onto the object to be labelled, which may be a fruit, if the afore-mentioned applicator is provided with labels (these latter preferably being self-adhesive labels) to be applied to the object.

In an advantageous embodiment of the invention a support strip for labels, carried by a reel, is wound onto a receiving roller, the said strip passing over the rollers of the label applicator which applies a distributed pressure to the object to apply the label thereto. In a further advantageous arrangement of the apparatus of the invention, the movement of the strip between the reel and the receiving roller is controlled by a passage detector provided at the entrance to the device. This can control the labelling process so that the part of the strip carrying a self-adhesive label arrives at the label applicator at that moment when an object is pressed between the rollers of the label applicator and the opposed pressing rollers.

The invention also provides a method of labelling fruit comprising conveying pieces of fruit in sequence along a converging pathway defined on one side by a label applicator

that comprises a set of rollers and on the opposed side by a further set of rollers that press fruit against the rollers of the label applicator and supplying a label to the side of the rollers of the applicator against which the pieces of fruit are pressed, wherein the rollers of the label applicator are resiliently movable by a piece of fruit in a direction away from the pressing rollers.

Apparatus constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawing, which is a plan view of a fruit labelling apparatus in partial cross-section.

With reference to the drawing, the arrow 1 indicates a conveyor belt which transports fruits from the left to the right, as seen in the drawing. The nature of the belt is such that the fruits cannot slide on it, even during ascending or descending sections. The labelling device comprises two main parts, indicated generally by the reference numerals 2 and 3, respectively, which, after assembly of the device, are positioned one at each side of the conveyor belt.

The parts 2 and 3 are slide-mounted on a support 5 which passes beneath the conveyor belt 1. The part 2 can be locked in a slide on the support 5 by a handle which is integral with a rapid-action locking mechanism 6. When the predetermined width between the parts 2 and 3 has thus been set, the final fixing of this width can be effected by tightening the bolts 4.

Mounted on the part 2 are rollers 8, having vertically aligned axes, which are used to press the fruit to be labelled against an applicator 9 mounted on the guide member 3. The diameters of the first three rollers 8, met by a fruit advancing from left to right on the conveyor belt 1, progressively increase in size so that the fruit, shown by chain dotted lines in the drawing, is shifted on the belt towards the applicator 9, irrespective of its initial position. The diameter of the fourth roller 8 is smaller than that of the third roller 8 so as to allow the fruit to be released, after labelling, from the constricted region between the rollers 8 and the applicator 9.

Obviously the width of the path between rollers 8 and the applicator 9 for an apple, for example, will be different to that for a melon. To compensate for that variation in the size of fruits to be labelled, the applicator 9, comprising four application rollers each mounted on a support 24 by way of a small spring 23, is so mounted that it can slide and pivot in a side of the support 5. The support 24 for the application rollers 9 can oscillate about a vertically-aligned pivot 7, the position of which, with respect to the support 5, can be set using by a handle 11. The desired position of the axis of the pivot 7, in the plane at right angles to it, is dependent on the

average size of the fruit to be labelled, and once this position is set it is fixed in this position for the fruit labelling session to follow.

A strip of paper 12, carrying self-adhesive labels to be applied to the fruit, is carried by a reel 13. When operations begin, the strip 12 is applied over a guide roller 14, over the applicator 9, over a guide roller 15, and then threaded onto a receiving reel 16.

The rotation of the receiving reel 16 which receives the strip of paper after the labels have been transferred onto the fruits, is controlled by a motor 17, the horizontal axle of which is mechanically connected to the shaft of the reel 16 by a bevel gear, not shown.

The starting of the motor is under the control of an electronic or electro-mechanical device 18 which acts as a time-lag relay. The device 18 receives the signals transmitted by a detector comprising a light source transmitter 20, and a photo-electric cell receiver 19.

The transmitter 20 is supplied with a d.c. or a.c. voltage source by conductors 22, whilst the receiver 19 is connected to the conductors 21 to the electric relay 18.

The rollers of the applicator 9 and the guide rollers 8 are covered with foam rubber so as to avoid bruising or squashing the fruits. This covering is removable.

The operation of the fruit labelling device described above, mounted on the conveyor belt 1, is as follows:

The passage of a piece of fruit along the conveyor belt 1 is detected by the detector 19, 20. At the end of a time determined by the speed of the conveyor belt 1, the fruit arrives at the first roller 8, then the second roller 8. It is hence shifted towards the applicator 9. At this moment the motor 17 is started, on actuation by the electric relay 18, and advances the strip or ribbon 12 carrying the labels by a distance equal to the length separating two consecutive labels, the adhesive faces of the labels being orientated towards the outside. Under the continuing advance of the fruit the rollers of the applicator 9 are squeezed around it by the action of the springs 23 and apply a label from the strip 12 to the surface of the fruit. The fruit then continues its movement, away from the parts 2 and 3, and the process is repeated for the next fruit.

The advancing movement of the strip 12 is not started until a certain number of seconds after the fruit has passed in front of the detector 19 and 20, this timelag corresponding to the time taken by the fruit to move across the distance between the detector and the applicator 9.

It is possible, of course, to have arrangements differing in detail from that described above while still keeping within the scope of the invention. For example, to trigger the feed movement of the strip 12, a microswitch

placed on the first roller 8 could be used. Further, the parts 2 and 3 may be fixed in position at the sides of the conveyor belt 1 by any appropriate means, as an alternative to the support 5.

It is also possible, in a case where the labels to be applied to the fruit are disposed between two strips of paper to provide two sets of receiving rollers separating the two strips in order that the labels can be applied to the fruit.

The fruits labelled by the apparatus of the invention, are capable by their distribution, of constituting a preferred support for advertising messages or any other message.

It is obviously possible to further modify the embodiments which have just been described, in particular by substituting mechanical equivalents for the various components.

WHAT I CLAIM IS:—

1. An apparatus for labeling objects of various shapes comprising a label applicator having a set of rollers, means for conveying objects to be labeled to the label applicator, a further set of rollers for pressing objects in turn against the rollers of the label applicator and means for supplying labels to the side of the rollers of the applicator against which, in use, the objects are pressed by the pressing rollers, wherein the two sets of rollers define between them a convergent pathway for the objects and the rollers of the label applicator are resiliently displaceable by an object in a direction away from the pressing rollers.

2. An apparatus as claimed in claim 1, wherein the rollers of the label applicator are each urged towards the pressing rollers by a spring.

3. An apparatus as claimed in claim 1 or claim 2, wherein the axes of the rollers of the label applicator are co-planar.

4. An apparatus as claimed in claim 3, wherein the set of rollers of the label applicator are inclined with respect to the direction in which, in use, the conveying means advances the objects to be labeled.

5. An apparatus as claimed in any one of claims 1 to 4, wherein the set of pressing rollers comprises rollers that increase in diameter in the direction that the objects are, in use, conveyed.

6. Apparatus as claimed in any one of claims 1 to 5, which further comprises detection means operable to detect an object being conveyed towards the label applicator, the label supplying means being responsive to a signal from the detection means to supply a label to the label applicator.

7. Apparatus as claimed in claim 6, wherein there is provided a time-lag relay operable to transmit a signal from the detection means to the label supplying means after a predetermined time delay after an object has been detected, the conveying means being arranged to convey objects at a predetermined rate and the predetermined time delay being arranged to be equal to the time taken for the conveying means to advance an object from the region of the detection means to the region of the image transfer means.

8. Apparatus as claimed in claim 7, wherein each of the rollers of the said set of rollers of the label applicator is at least partially constructed from resilient material.

9. Apparatus for the automatic labelling of object of differing shapes, substantially as hereinbefore described with reference to, and as shown in, the accompanying drawing.

10. An object that has been labelled by an apparatus as claimed in any one of claims 1 to 9.

11. A labelled object as claimed in claim 10, which is a fruit.

12. A method of labelling fruit comprising conveying pieces of fruit in sequence along a converging pathway defined on one side by a label applicator that comprises a set of rollers and on the opposed side by a further set of rollers that press fruit against the rollers of the label applicator and supplying a label to the side of the rollers of the applicator against which the pieces of fruit are pressed, wherein the rollers of the label applicator are resiliently movable by a piece of fruit in a direction away from the pressing rollers.

13. A fruit that has been labelled by the method claimed in claim 12.

ABEL & IMRAY,
Chartered Patent Agents,
Northumberland House,
303-306 High Holborn,
London, WC1V 7LH.

