APPARATUS FOR APPLYING THERMOPLASTICALLY
ADHESIVE LABELS TO A WRAPPED PRODUCT
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This invention relates to a method and apparatus for applying thermoplastically adhesive labels to a wrapped product.

The invention has been used in the labeling of wrapped cheese but is obviously not limited to this particular product, despite certain advantages in the packaging of cheese.

The labeling method is conducted as a continuous operation commencing with the emergence of the wrapped cheese from the wrapping machine upon a conveyor belt. The portions of the wrapper which lap each other are on the lower face of the wrapped product, and rest upon the belt.

If the heat sealed wrapper comprises a shrinkable film such as “Saran,” it is important to pre-heat for the purpose of shrinking the film before any labeling is done. Accordingly, with this type of wrapper, the package is first passed through an oven which shrinks the wrapper. If the wrapping film is dimensionally stable in the presence of heat, this step is omitted.

Upon emerging from the oven, the cheese is subjected to a jet of steam, the moisture of which condenses to form a thin film of moisture on the exposed top surface of the wrapper. An operator then applies the top label to the moistened surface. The moisture has no effect whatever on the thermoplastic adhesive with which the label is coated but provides sufficient adhesion, due to the moisture alone, so that the label retains its position on the smooth face of the wrapper. Coincidentally, another label is placed face down, with its thermoplastic coated back uppermost, on the conveyor between two successive packages.

The successive packages, each having a moisture-adhered label on its smooth face, and the intervening inverted labels on the conveyor now pass through a second heating oven. The heat developed in the second oven softens the thermoplastic adhesive of both labels causing the one on the face of the package to become permanently adherent to the wrapper. As the packages bearing their first labels issue from the oven, an operator takes each package and moves it forward onto the heated face of the label ahead of it on the conveyor. This label attaches itself across the lapping surfaces of the cheese wrapper despite relative irregularity of the wrapper at the back of the package, good adhesion is secured because the weight of the contents of the package holds the package tightly to the label until the thermoplastic coating of the label has set.

As an alternative procedure, both labels may be placed face down on the conveyor to have their thermoplastic adhesive coatings softened in passing through the oven, after which the smooth face of the wrapped product may first be engaged with one of the labels, and the package may then be inverted and engaged with the other of the labels and left in pressure contact with the second label under its own weight, as above described.

In the drawings:

Fig. 1 is a diagrammatic view in perspective showing the successive steps in the practice of the invention, portions of the oven being broken away to expose the heating elements therewithin.

Fig. 2 is a view in perspective showing one of the labels with a corner turned up to expose its thermoplastic adhesive coating.

Fig. 3 is a view in perspective of the front labeled package.

Fig. 4 is a view in perspective of the package as it appears with its back label in place.

The conveyor belt 5 carries a succession of spaced packages 6 from the wrapping machine 7. Purely for illustrative purposes, the packages are wrapped as wedge shaped blocks of cheese. The wrapper may be “Saran” or any other suitable wrapping film, such as “Pilofilm,” “Listen” foil and others. It will be observed that on the front face 8 (Fig. 3) the wrapper is perfectly smooth, all free margins of the wrapper being brought to the rear face 9 and lapped as shown in Fig. 4. As the product issues from the wrapping machine, the smooth face 8 is uppermost.

The package 6 passes beneath a heating oven 10 which may be of any suitable form or shape and equipped with heating means of any appropriate type and arrangement. For purpose of illustration, radiant electrical resistance bars 11 are shown to represent the heating elements. In the oven 10, the plastic wrapper will shrink into intimate contact with the packaged goods. If the goods comprise cheese, the radiant heat will reverse the emulsion of the surface of the cheese, bringing oil to the surface which bonds the wrapper to the product. For the purpose of the present invention, it is only necessary that any shrinkable wrapper be pre-shrunk so that it will not shrink after the label has been applied.

Upon emergence from the oven 10, the package 6 is subjected to jets 12 of steam which condenses on the exposed surface 8 of the wrapper to form a film of moisture. This film is hardly visible. It serves the function of a temporary adhesive.

An operator at the station, indicated by reference character 13 in Fig. 1, handles two labels 14 and 15 substantially concurrently. Label 14 is applied to the moistened exposed top surface 8 of the package where it adheres in the position at which it is applied, due to the moisture. The label 15 is laid face down on the conveyor between successive packages 6 with its coated surface uppermost. Both labels have their back surfaces coated with thermoplastic adhesive, as shown at 16 in Fig. 2. As the conveyor passes beyond station 13, it will carry alternating packages and inverted labels, each package having its front label disposed on the face of the package with the adhesive coating against the wrapper but not bonded otherwise than by the moisture.

The packages and alternately intervening back labels now pass immediately through another oven 20. Since the heating elements 21 may develop more heat than was required in oven 10, a jacket may be provided at 22 and a vent 23 may carry off heated air from the space between the jacket and the oven.

As the packages pass through the oven 20, the radiant heat from elements 21 will penetrate the top labels 14 to soften the thermoplastic adhesive coating at the back faces of the labels. This coating is in face contact with the wrapper, being maintained in contact solely by such adhesion as is developed by the moisture. This is adequate to maintain the contact until the adhesion of the thermoplastic coating 16 becomes effective.

At the same time, the adhesive coatings of the inverted labels 15 have become softened by the heat of oven 20. Accordingly, as the packages and the labels 15 issue from the oven, an operator at station 24 lifts each package and systematically places it upon the inverted label 15 which lies either immediately behind it or immediately in front...
of it. It is obviously immaterial in what direction the packages move respecting the path of travel of the conveyor, since there is an inverted label for every package and the only objective is to place each package in turn upon one such label.

As shown in Fig. 4, the back label 15 will ordinarily be of such dimensions that when the package is applied over its gummed face the label will span the lapping portions of the wrapper at the back of the package. No particular skill or experience is required to locate the package with reasonable accuracy upon the inverted label to produce the general effect indicated in Fig. 4.

The weight of the package upon label 15 maintains intimate contact between the wrapper and the adhesive surface until the thermoplastic sets.

An advantage of the equipment and method described is its simplicity and low cost. As compared with previously known labeling equipment, its cost is about ten percent; it requires only half as many operators and it can handle at least three times as much work in a given period.

While the method and apparatus as described are preferred, it has already been indicated that the first oven need not be used if the wrapper is dimensionally stable. It has also been indicated that the water spray need not be used if both labels have their coatings subjected to heat in advance of application to the wrapper, being applied thereafter in successive operations to the opposite faces of the package with the package desirably imposing its weight upon the label applied to the lapped portions of the wrapper until the adhesive has thoroughly set.

The claimed subject matter is:

1. Labeling apparatus comprising a heating oven, conveyor means for passing through said oven workpieces to be labeled with labels having a thermoplastic adhesive to be softened in the oven and means for preliminarily moistening the faces of successive workpieces to apply thereto an adhesive film which temporarily adheres such labels to the workpieces pending softening of said thermoplastic adhesive in the oven.

2. Labeling apparatus comprising a heating oven, conveyor means for passing through said oven workpieces to be labeled with labels having a thermoplastic adhesive to be softened in the oven and means for preliminarily moistening the faces of successive workpieces to apply thereto an adhesive film, in further combination with a pre-heating oven through which the conveyor passes enroute to the first mentioned oven for preshrinking dimensionally unstable wrappers, the moistening means being disposed along the conveyor path between said ovens.

3. The device of claim 1 in which the moistening means comprises a steam pipe having a jetting nozzle directed toward the position of workpieces on the conveying means.

4. A method of labeling a workpiece, which method comprises inverting a label having a thermoplastic adhesive coating, subjecting the inverted label to heat sufficient to soften the coating, and placing upon the adhesive surface of the inverted label a workpiece to be labeled.

5. A continuous labeling operation which comprises the deposit upon a conveyor of inverted labels having their exposed faces coated with a thermoplastic adhesive, passing the conveyor and said labels beneath a source of heat, whereby the coated exposed surfaces of the labels become adhesive, and placing workpieces successively upon the adhesive exposed surfaces of the labels on the conveyor and leaving the labels subject to the weight of the workpieces until the labels adhere to the workpieces.

6. A method of labeling opposed faces of a workpiece with labels having a thermoplastic coating on their back surfaces, which method comprises temporarily adhering a face label to each workpiece with its coated surface in contact with the workpiece, exposing successive workpieces to heat sufficient to penetrate the face labels and soften the thermoplastic coating to render it permanently adhesive to the workpiece, substantially concurrently heating an inverted back face label to soften its thermoplastic coating and thereupon laying each workpiece on top of an inverted back label in contact with the adhesive thermoplastic coating thereof and leaving the back label and such coating subject to the weight of the workpiece until the back label is adherent to the workpiece.

7. The method recited in claim 6 in which the temporary adherence of face labels to workpieces is secured by preliminarily moistening exposed faces of the workpieces and using the moisture for the temporary adherence of face labels thereto.

8. A method of labeling a wrapped product, the wrapper comprising a plastic film adapted to shrink in the presence of heat and the label having a thermoplastic coating, which method comprises heating the plastic wrapper to shrink it upon the wrapped product, temporarily adhering the coated label to a face of the wrapper and subjecting the wrapped product and temporarily adhered label to heat sufficient to soften the label coating during its temporary adherence to the wrapper and to render it permanently adherent thereto.

9. A method of continuously labeling a face of a product wrapped with plastic film, such method consisting in jetting steam upon an exposed face of the wrapper to effect the moistening of such face, applying a thermoplastically coated surface of a face label to the moistened wrapper surface to be temporarily adhered thereto by the moisture and heating the wrapped product and temporarily adherent label to soften the coatings of the label while it remains adherent to the wrapper to make its adherence permanent upon the setting of the thermoplastic coating.

10. The method recited in claim 9 including the further steps of labeling another face of each such wrapped products, said further steps comprising inverting a second label to expose its coated surface uppermost, heating the thermoplastic coating of the coated surface to render it adhesive and placing upon such inverted second label in contact with its adhesive coating the surface of the wrapper to which such label is to adhere, whereby the wrapper and label will be subject to the weight of the wrapped product until the thermoplastic adhesive sets to adhere the label to the wrapper.

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