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(54) **Pizza topping apparatus**

(57) Coating an edible substrate e.g. pizza bases with a cheese topping by a workstation made up of a reservoir 71 for secondary material e.g. cheese in the form of discrete pieces such as shredded or particulate material at or near an input end of, a transfer belt 15 having an input end to receive secondary material from the reservoir and an output end located to transfer material from the workstation; a first rotatable rake member 21 positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary material carried along the belt from the input end towards the output end to a first height; a second rotatable rake member 22 positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary material carried along the belt from the input end towards the output end from the first to a second height lower than the first; and drive means for the first and second rake members.

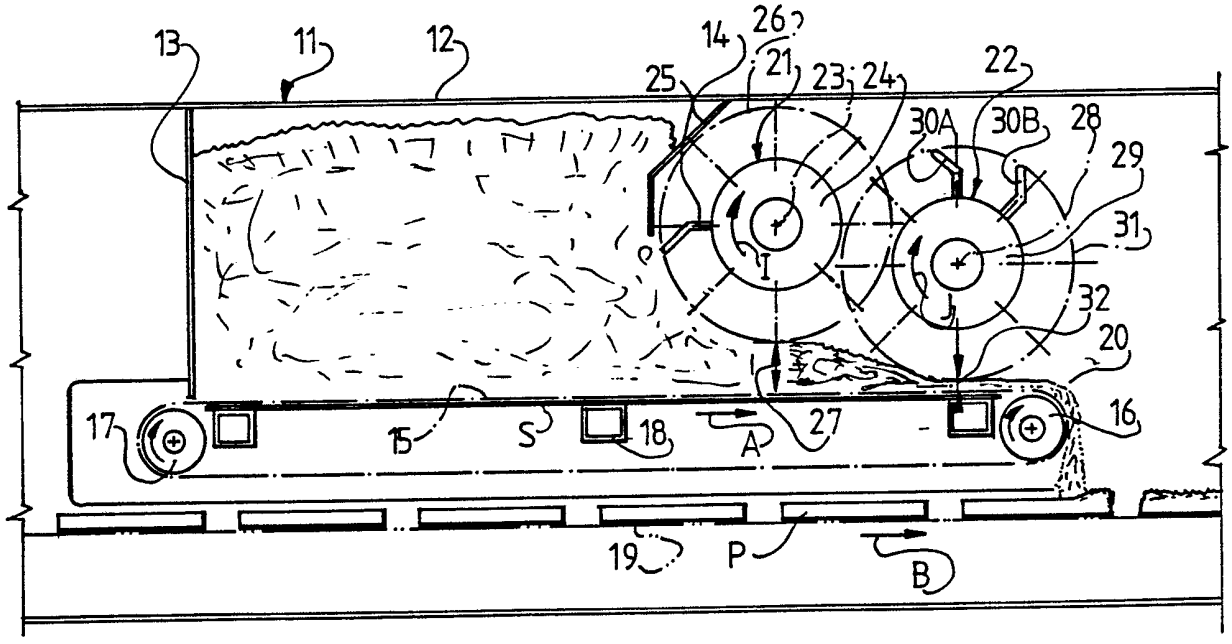

Fig 1

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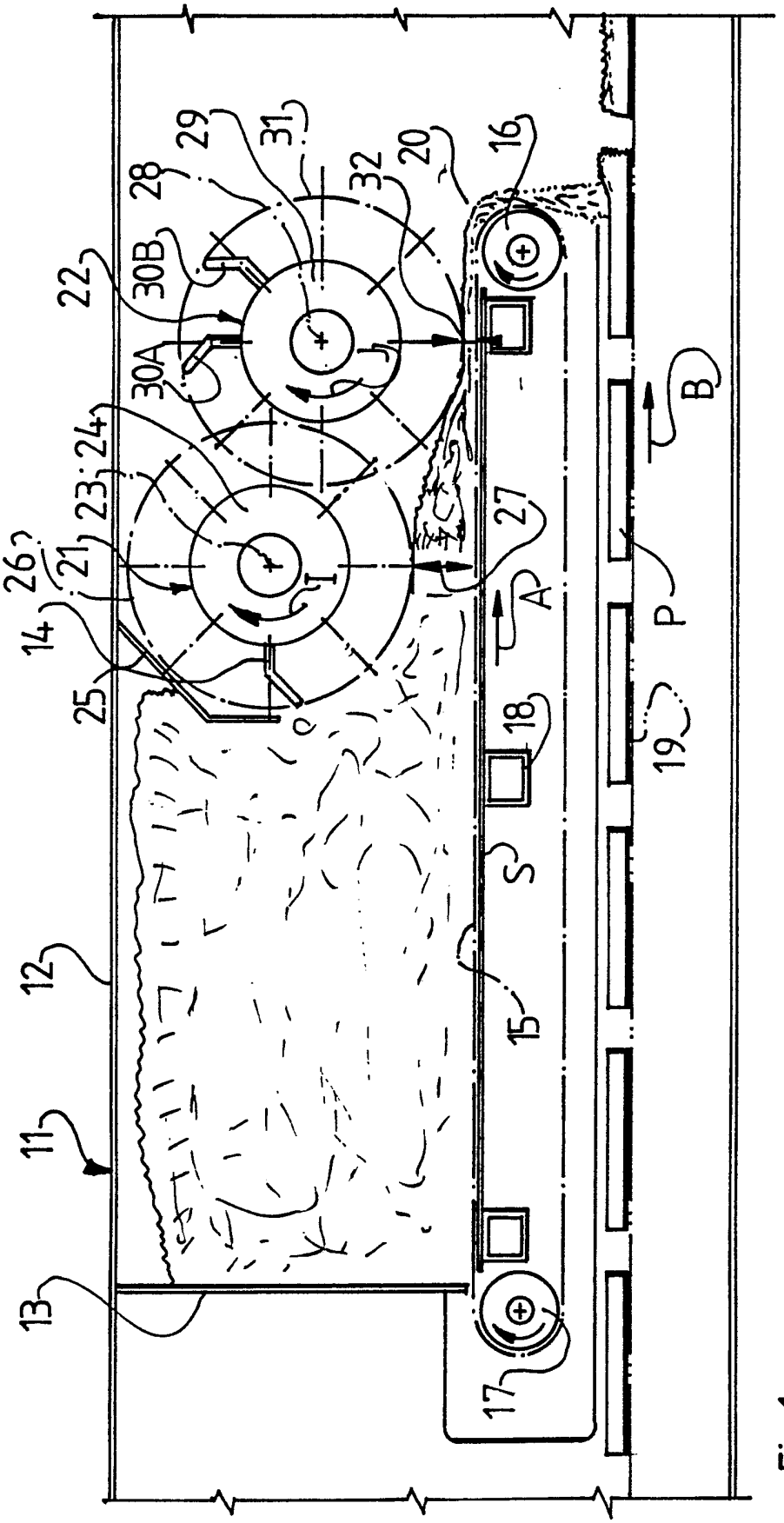
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Fig 1

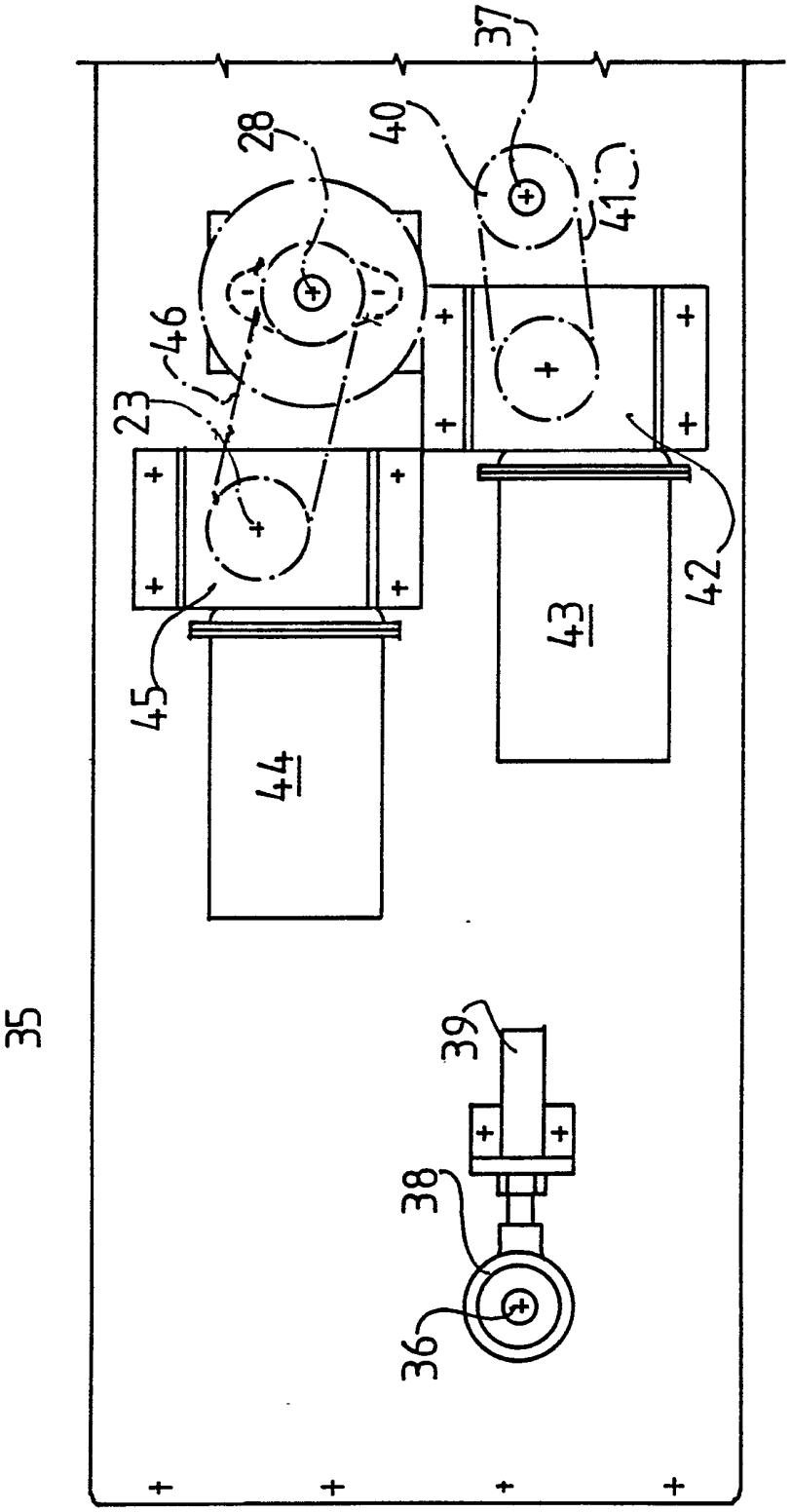

Fig 2

METHOD AND APPARATUS FOR FOOD PREPARATION

This invention relates to method and apparatus for food preparation. In particular it is concerned with the coating of an edible substrate with a secondary material.

For depositing a layer of liquid secondary material on a substrate, such as a bread or pizza base, it is known to coat the substrate by spraying or extruding the coating material. However the requirement can arise for a secondary material to be used which cannot be liquified. In this case it becomes necessary to deposit the secondary material in a particular physical form such as particles, flakes or shredded pieces.

According to a first aspect of the present invention there is provided a method of coating an edible substrate material with a deposition of secondary material comprising:

a) traversing the substrate, such as by means of a conveyer, along a path past a workstation;
b) providing a store of secondary material in the form of discrete pieces such as shredded or particulate material at or near an input end of a transfer belt;
c) displacing secondary material from the store reservoir by means of the transfer belt to pass from the input end to an output end;
d) regulating the thickness of secondary material on the belt and displaced by the belt from the input to the output end to a first value by means by means of a first rotating rake member and thereafter;
e) regulating the thickness of material from the first value to a second value by means of a second rotating rake towards the output end; and locating the output end above the path so as to cause secondary material falling from the output end to be deposited on a substrate passing beneath the output end.

Preferably the first and second rake members are adapted to rotate at different speeds relative to each other and are positioned so as to interact with one another to promote shredding or some other form modifying action on secondary material in passing along the transfer belt.

According to a second aspect of the present invention there is provided a workstation for use in conjunction with a conveyer to enable an edible substrate presented to the workstation by way of the conveyer to be coated with a deposition of a secondary material comprising:

a) a reservoir for secondary material in the form of discrete pieces such as shredded or particulate material at or near an input end of

b) a transfer belt having an input end to receive secondary material from the reservoir and an output end located to transfer material from the workstation;

c) a first rotatable rake member positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary material carried along the belt from the input end towards the output end to a first height;

d) a second rotatable rake member positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary material carried along the belt from the input end towards the output end from the first to a second height lower than the first; and

e) drive means for the first and second rake members.

In a first preferred version of the second aspect of the present invention the first and second rotatable rakes interact with one another. Typically the centres of the first and second rotatable rake members are spaced by an amount which is less than the sum of the outside diameters of the members.
In a second preferred form of the present invention the drive means for the first and second rake members enable the members to rotate at different speeds to promote shredding or some other form modifying action on secondary material in passing along the transfer belt.

An exemplary embodiment of the invention will now be described with reference to the accompanying drawing of a work station for a pizza coating machine of which:

Figure 1 is side sectional elevation; and
Figure 2 is a side view showing shrouding and drive arrangements for the components disclosed in Figure 1.

Figure 1 shows a reservoir 11 for shredded cheese bounded by a side plate 12, a back plate 13 and a part angled front plate 14. The bottom of the reservoir

11 serves as an input to a transfer belt 15 (shown in chain dotted outline) which is mounted on two conveyer rollers 16, 17. The roller 16 serves to drive the belt 15 such that the top part of the belt moves in the direction of arrow A. The underside of the top portion of the transfer belt 15 is supported by plate S carried on square section cross supports 18 which are secured at their far ends to the side plate 12.

The work station is mounted above a main conveyer 19 which serves to convey pizza bases P below and past outlet end 20 of the transfer belt 15.

Between front plate 14 and outlet end 20 are provided first rotatable rake member 21 and second rotatable rake member 22.

Member 21 is mounted for rotation about axis 23 in direction of arrow I . The member 21 is made up of a body centre 24 on which are mounted rake teeth, typically tooth 25, which result in the member 21 having an outside swept periphery 26 when rotating. The member 21 is mounted so as to leave a clearance 27 between the nearest part of the transfer belt 15 and the lowest part of the outside swept periphery 26.

Member 22 is mounted for rotation about axis 28 in the direction of arrow J. The member 22 is made up of a body centre 29 on which are mounted rake teeth, typically teeth 30A, 30B which result in the member 22 having an outside swept periphery 31 when rotating. The member 22 is mounted so as to leave a clearance 32 between the nearest part of the transfer belt 15 and the lowest part of the outside swept diameter 31.

The distance between the axes 23, 28 is less than half the sum of the diameters of the peripheries 26, 31 providing for intermeshing of the volumes swept by the rake teeth of members 21, 22.

Figure 2 shows the outside of side plate 35 of the work station. The side plate 35 lies on the opposite side of the transfer belt 15 to side plate 12 and serves as a mounting point for various operating devices for the work station.

Conveyer rollers 16, 17 for the transfer belt 15 are supported by, respectively, bearings 36, 37.

Bearing 36 is carried on a floating housing 38 which can be displaced by way of a threaded screw from an anchorage 39 to provide for tensioning the transfer belt.

Bearing 37 carries a drive sprocket 40 which is coupled by belt 41 to a gearbox 42 which is driven by motor 43.

A further motor 44 and gearbox 45 serve to drive rake member 21 about axis 23 and, by way of belt 46, member 22 about axis 28. The speeds of rotation of the members 21, 22 can be made to differ by the use of appropriate drive sprockets linked by belt 46.

To use the workstation shredded cheese is fed into the reservoir 11. The motor 44 energized to cause rotation of rake members 21, 22. Motor 43 is energized to drive transfer belt 15 in the direction of arrow A. Movement of the transfer belt results in cheese from the reservoir 11 being swept towards the first rake member 21. As a result the layer of cheese on the transfer belt is reduced to a thickness corresponding to clearance 27 between the belt 15 and the swept diameter of the 26. The reduced thickness layer then passes to the second rake member 22 where the layer thickness is further reduced down to that corresponding to clearance 32. The interaction between the two rake members 21, 22 causes a degree of stripping and shredding of the cheese so ensuring that the cheese material is in the required physical condition to optimise the coating process.

Finally the transfer belt 15 sweeps the finally reduced thickness layer to the outlet end 20 from which the cheese cascades downwardly onto pizza bases passing beneath the outlet end 20 on conveyer 19. The cheese coats the base upon which it is deposited and the coated pizza then passes to the next workstation. Surplus cheese passes to a return system which serves to convey the surplus cheese back to the reservoir 11.

CLAIMS

1 A method of coating an edible substrate material with a deposition of secondary material comprising:

a) traversing the substrate, such as by means of a conveyer, along a path past a workstation;

b) providing a store of secondary material in the form of discrete pieces such as shredded or particulate material at or near an input end of a transfer belt;

c) displacing secondary material from the store reservoir by means of the transfer belt to pass from the input end to an output end;

d) regulating the thickness of secondary material on the belt and displaced by the belt from the input to the output end to a first value by means by means of a first rotating rake member and thereafter;

e) regulating the thickness of material from the first value to a second value by means of a second rotating rake towards the output end; and locating the output end above the path so as to cause secondary material falling from the output end to be deposited on a substrate passing beneath the output end.

2 A method of coating as claimed in Claim 1 wherein the first and second rake members are adapted to rotate at different speeds relative to each other and are positioned so as to interact with one another to promote shredding or some other form modifying action on secondary material in passing along the transfer belt.

3 A workstation for use in conjunction with a conveyer to enable an edible substrate presented to the workstation by way of the conveyer to be coated with a deposition of a secondary material comprising:

a) a reservoir for secondary material in the form of discrete pieces such as shredded or particulate material at or near an input end of

b) a transfer belt having an input end to receive secondary material from the reservoir and an output end located to transfer material from the workstation;

c) a first rotatable rake member positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary

material carried along the belt from the input end towards the output end to a first height;

d) a second rotatable rake member positioned above and transverse the transfer belt and adapted to regulate the thickness of secondary material carried along the belt from the input end towards the output end from the first to a second height lower than the first; and

e) drive means for the first and second rake members.

4 A workstation as claimed in Claim 3 wherein the first and second rotatable rakes interact with one another.

5 A workstation as claimed in Claim 4 wherein the centres of the first and second rotatable rake members are spaced by an amount which is less than the sum of the outside diameters of the members.

6 A workstation as claimed in Claim 3, 4 or 5 wherein the drive means for the first and second rake members enable the members to rotate at different speeds to promote shredding or some other form modifying action on secondary material in passing along the transfer belt.

7 A workstation as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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