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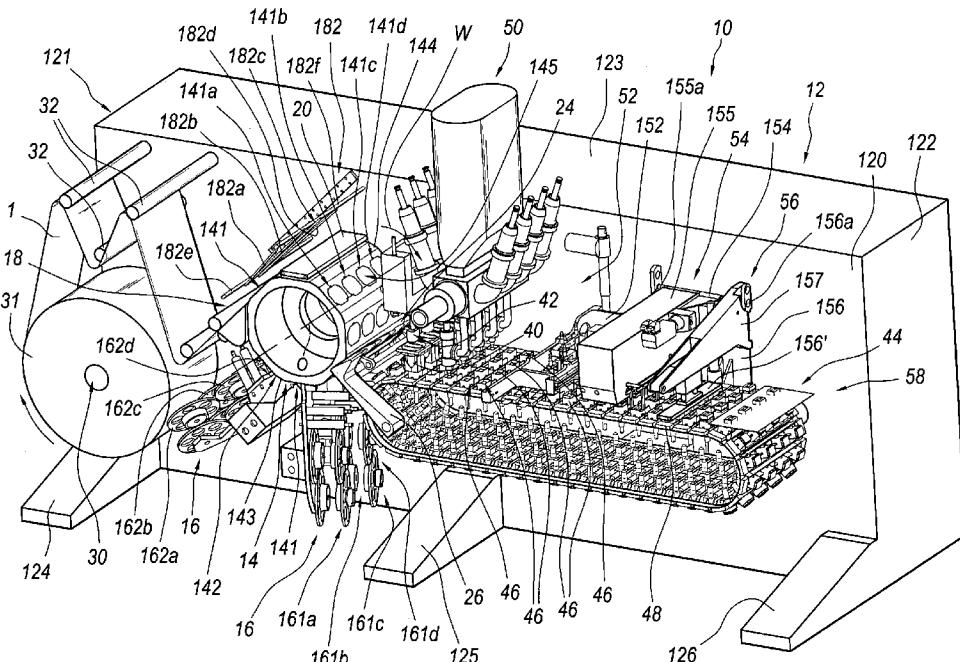
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(54) Title: APPARATUS FOR PACKAGING A PRODUCT



DescriptionApparatus for packaging a product5 Technical Field

This invention relates to an apparatus for packaging a product, in particular for wrapping the product in a piece of suitable wrapping material.

10 The product to be packaged is preferably a food product, especially a pasty food product such as processed cheese, a stock cube, butter, margarine and the like. The product might, however also be a semi-liquid or a solid food product such as yoghurt or a mature cheese, respectively.

Background Art

15 Packaging apparatus, in particular for pasty food products such as processed cheese portions, are known in prior art.

One disadvantage of prior art apparatus for packaging pasty products is that some parts of the apparatus are difficult to access, causing problems to personnel responsible for sanitizing the apparatus and creating a real risk to the hygiene and healthiness of the product being packaged.

20 Another disadvantageous aspect of prior art machines relates to their configuration which does not allow operators to monitor all the parts of a machine simultaneously and thus making it difficult take prompt action when required. That is because in prior art machines of this kind, some working areas are hidden or screened from each other.

25

Disclosure of the Invention

It is provided a packaging apparatus, in particular for food products, especially pasty food products such as processed cheese, stock cubes, butter, margarine and the like, to be wrapped preferably in a suitable wrapper, the apparatus comprising a mounting frame, operating means for preparing the package and means for driving said operating means, the apparatus being characterized in that the mounting frame comprises partition means which extend lengthways along the apparatus, and from which the corresponding operating means in turn extend and which separate the operating means from the drive means.

30 35 Thus, the operating means which make the package are totally separate from the respective drive means, with obvious advantages in terms of packaging

hygiene and accessibility to machine parts, since personnel responsible for operating the machine can easily access the operating parts from one side of the machine, while the drive elements are on the opposite side.

This also makes it easier and quicker to sanitize the apparatus.

5 Other advantageous aspects of the apparatus according to the invention are set out in the other claims.

Brief Description of the Drawings

10 These and other technical characteristics of the invention are clearly described in the appended claims and the advantages of the invention are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of it provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is a perspective view of a preferred embodiment of the apparatus according to the invention;
- Figure 2 is a perspective view of the preferred embodiment of the apparatus according to the invention, illustrating the package closing means in the raised condition;
- Figure 3 is a perspective view showing only the package being made up;
- Figure 4 is a perspective view of the preferred embodiment of the invention shown from the side opposite the views of Figures 1 and 2;
- Figure 5 is a perspective detail view showing the label application means of the preferred embodiment of the apparatus according to the invention;
- Figure 6 is a side view showing only the means for feeding the cup-shaped wrappers in the preferred embodiment of the apparatus according to the invention.

Description of the Preferred Embodiments of the Invention

30 The accompanying drawings show a preferred embodiment 10 of the packaging apparatus according to the invention, in particular for packaging a food product.

The apparatus is especially suitable for packaging a pasty food product such as processed cheese, stock cubes, butter, margarine and the like.

35 The apparatus might, however, also be suitably adapted for use in packaging other products, be they semi-liquid, pasty, or solid, such as for example mature cheese portions.

The apparatus according to the invention packages the product in a wrapper made from a film, in particular a plastic film or a film in the form of aluminium

foil. Preferably, however, the wrapping film used is made from a foldable material, that is to say, a material that keeps the folded shape imparted to it.

The wrapper comprises a sheet obtained from the film cut into a suitable shape and folded in such a way as to enclose the product.

5 Besides the sheet of plastic film, aluminium foil or other material, the package also comprises means, in the form of at least one plastic tape, for tearing and opening the wrapper and a label if necessary. It will be understood, however, that the apparatus according to the invention might also make packages without tearing and opening means and/or without labels.

10 The finished package may be triangular, in the shape of the sector of a circle, quadrangular or other desired shape.

In this description, the term "parts" of the wrapper in the plural form is used to mean either the plurality of parts mentioned above, that is to say, the sheet, the means for tearing and opening the wrapper and the label or only the sheet when 15 the apparatus is used to make wrappers comprised of the sheet only, or both the sheet and the tear means, or both the sheet and the label, in the case of wrappers comprising only two parts. Obviously, wrapper parts other than the ones specified here might also be contemplated.

20 As illustrated, the apparatus 10 comprises a mounting frame 12 and operating means for preparing the wrapper from the respective parts, as described in more detail below, and which are driven by respective drive means, which are not illustrated in detail in the accompanying drawings.

25 Advantageously, the mounting frame 12 defines partition means 120 which extend lengthways along the apparatus, that is to say, in the direction in which the packages being formed are fed and which mount operating means that are separated from the respecting drive means by the partition means 120 themselves.

30 This means that the operating means which make the package are totally separate from the respective drive means, with obvious advantages in terms of packaging hygiene and accessibility to machine parts, since personnel responsible for operating the machine can easily access the operating parts from one side of the machine, while the drive elements are on the opposite side.

Thus, much time is saved because personnel attending to the apparatus do not need to move from one place to another as they do with machinery made according to prior art.

35 The apparatus is also very easy to clean, making its sanitization a quick and easy task.

The partition means 120 are advantageously embodied as a flat longitudinal

wall 120 that extends in a straight line in front of an operator standing beside the apparatus and facing the operating means of the apparatus, as may be inferred from Figures 1, 2 and 4.

As illustrated, the frame 12 also comprises a transversal wall 121 upstream, 5 a transversal wall 122 downstream, and a covering top wall 123. Obviously, the apparatus may be completed by walls and doors, preferably transparent, covering the operating area where the packages are made.

Means 124, 125, 126 are also provided for supporting the frame on the floor, which protrude transversally from the partition means 120 and which extend 10 under the operating means of the apparatus.

These means for support on the floor comprise a plurality of feet 124, 125, 126, distributed lengthways, the feet 124 and 126 being located at the upstream and downstream ends of the apparatus and the foot 125 substantially half way along the apparatus.

15 The wall 120 has respective holes made in it, not illustrated in detail in the drawings, through which the operating means that make the packages are connected to the drive means on the other side (not shown) of the longitudinal wall 120. Shafts or other suitable transmission means for the respective drive elements extend through these holes.

20 The apparatus according to the invention comprises means 14 for feeding the parts used to make the wrapper.

More specifically, the feed means 14 assemble the parts of the wrapper, as will become more evident in the rest of the description below.

25 Advantageously, the means 14 for feeding the wrapper parts extend transversally from the partition means 120 and are rotatable about a horizontal or substantially horizontal axis O.

30 Advantageously, these means for feeding the wrapper parts rotate in clockwise direction, as indicated by the arrow W in Figure 1. Clockwise in this case refers to the direction of rotation as viewed by an observer facing the partition wall 120 and looking at the rotatable means 14.

It is thus possible to obtain a more convenient and advantageous layout of the devices that dispense the parts of the wrapper.

35 According to present apparatus, the means 14 for feeding the wrapper parts move with alternating motion, moving forward and stopping at the operating stations where the wrapper parts are assembled.

The means 14 for feeding the wrapper parts comprise an outer surface having a shaped profile that defines a plurality of circumferentially distributed

sites 141 designed to accommodate the wrapper parts, and in particular, to progressively accommodate the parts of a single wrapper.

According to another aspect, the feed means 14 comprise a plurality of transversally aligned sites which make it possible to advance a plurality of parallel 5 rows of respective wrapper parts. More specifically, each circumferential face of the roller-like means for feeding and assembling the parts of the wrapper affords a first, a second, a third and a fourth site, labelled 141a, 141b, 141c and 141d and transversally aligned with each other.

The roller-like means 14 for feeding the wrapper parts thus comprise a 10 revolving member 142 having a plurality of flat faces 143 where the sites 141 for accommodating the wrapper parts are made.

The flat faces 143 are wide surfaces circumferentially distributed and extending in a direction perpendicular to respective radii extending from the axis of rotation "O" of the roller means 142.

15 The wide flat faces 143 are separated from each other by shorter circumferential sections 144.

As a whole, the faces 143 for accommodating the wrapper parts extend at right angles to planes passing through the axis "O" and through the centre line of the respective face 143 and make with the adjacent faces, or sites, 143 an 20 orientation angle greater than 135°.

In practice, the lateral surface of the roller 14 has a generally polygonal shape with long sides and short sides, the sites for accommodating the parts of the wrapper being made at the long sides. More specifically, the outer profile of the roller-like member has a generally octagonal shape defining eight consecutive 25 faces for accommodating the parts of the wrapper.

In particular, the sites 141 for accommodating the parts of the wrapper comprise a surface 145 for supporting the parts and means for retaining the parts on the supporting surface 145. The retaining means are embodied as suction means comprising holes in the area, or surface, 145 that supports the respective part, and conduits that put the suction holes at each site selectively in communication with a vacuum source. The suction holes and conduits are not illustrated in detail in the accompanying drawings.

30 As illustrated, the roller 14 for feeding the wrapper parts extends from the vertical partition wall 120, said roller being driven by a respective axial shaft, not illustrated in the drawings, which extends through a large hole made in an area upstream of the partition wall 120.

The roller means 14 may be associated removably with the apparatus and

there may be a plurality or set of roller means to be used according to process requirements, in particular according to the size of the package to be made.

Means 16 are advantageously provided for placing tear tape means on respective sites 141 of the means 14 for feeding the parts of the wrapper.

5 As illustrated in Figure 3, the tear tape means comprise a first tear tape 2 and a second tear tape 3 which are suitably crossed over each other, as shown in Figure 3, in a manner well known to experts in the trade and therefore not explained in further detail. Other tear tape configurations are also imaginable, however.

10 In particular, there are four means 161a, 161b, 161c, 161d for placing tear tapes 2 on respective transversally aligned sites on the feed roller 14.

As shown, the tear tape placing means 16 also comprise second means 162a, 162b, 162c, 162d for placing respective second tear tapes 3.

15 As illustrated, the means 16 for placing the tear tape means are advantageously mounted under the means 14 for feeding the parts of the wrapper.

Further, as illustrated, the means for placing the second tear tapes 3 are mounted downstream and, in particular, immediately downstream of the means that place the first tapes 2 in the direction in which the wrapper parts are fed by said feed means.

20 Thus, while the first tear tape placing means place the four rows of first tear tapes 2 on respective downward facing sites of the feed means 14, the means for placing four parallel rows of second tear tapes 3 operate on the adjacent sites, that is to say, the sites on the part of the feed means 14 facing down and to one side.

25 It will be understood, however, that tear tape placing means which can place differently shaped tear tapes in a different manner might also be used instead of the means described here.

The means for placing the tear tapes 2, 3 are mounted on respective mounting means, not illustrated in the drawings, which extend transversally in cantilever fashion from the partition means 120.

30 As illustrated, each of the means for placing a respective tear tape comprises means for mounting respective rolls of film from which the tear tape is obtained, means for feeding the tear tape film and means for cutting the tear tape from the film, which is preferably a plastic film. The means for feeding and cutting the tear tape film are not illustrated in detail in the accompanying drawings.

35 Means for guiding the tear tape placing means may be provided to enable the placing means themselves to be pulled out and, if necessary, lifted in order to change the tear tape film roll.

Means 18 are also advantageously provided for placing the sheet constituting the main body of the wrapper on a respective site of the means 14 for feeding the parts of the wrapper.

5 In particular, the sheet is placed over the first and second tear tapes 2 and 3, as illustrated in Figure 3, where the sheet is denoted by the reference numeral 4.

More specifically, the means for placing the sheet 4 are designed to place four parallel rows of sheets on transversally aligned sites on the feed roller 14.

10 As illustrated, the means 18 for placing the sheet 4 on the wrapper part feed means are mounted downstream of the tear tape placing means 16 in the direction in which the wrapper parts are fed by the feed means 14.

In particular, the sheet placing means 18 extend beside the feed means 14 and are designed to place the sheets 4 on respective transversally aligned sites 141a, 141b, 141c, 141d on the part of the feed means 14 facing up and to one side.

15 In practice, between the means that place the second tear tapes 3 and the means that place the sheets 4, there is an empty station, corresponding to the sites on the vertically positioned face of the lateral surface of the roller 14, there being cutting means mounted alongside the vertically positioned sites for cutting the wrapper sheets 4 from the film 1, as described in more detail below.

20 The means for placing the sheets comprise means for feeding the film 1 and means for cutting the film. The means for cutting and feeding the wrapper sheet film 1 are not illustrated in detail in the accompanying drawings.

The means 18 for placing the sheets 4 on the feed means 14 also comprise means for gripping the cut sheets 4 and means for guiding said gripper means.

25 The sheet 4 gripper means, not illustrated in detail in the accompanying drawings, are guided by respective guide devices or means 182, comprising rails 182a, 182b, 182c, 182d for respective sheet 4 gripper means.

30 These straight rails 182a, 182b, 182c, 182d extend in divergent directions starting from the position where the sheet is picked up to the position where the sheet is delivered to the respective site on the feed means 14. As illustrated, the ends of the longitudinal guide rails 182a, 182b, 182c, 182d are mounted on respective crossbars 182e, 182f.

The guide means 182, which are not illustrated in detail in the drawings, are removably associated with the apparatus and extend transversally in cantilever fashion from the partition wall 120.

35 It is contemplated the provision of a plurality, or set, of devices, or means, 182 for guiding the sheet gripper means, comprising different rails 182a, 182b, 182c, 182d, having substantially the same length for a suitable longitudinal stroke

of the sheet gripper means and a different angle of relative divergence in order to allow guiding of gripper means for different package sizes, that is to say, to allow the sheets to be placed in different transversal positions according to the size of the sheet and package being made.

5 In other terms, for each different sheet size, the guide means or devices have guide rails 182a, 182b, 182c, 182d whose respective ends 182'a, 182'b, 182'c, 182'd in the area where the sheets are picked up are at substantially the same transversal distance d'a, d'b, d'c from each other but whose ends 182''a, 182''b, 182''c, 182''d in the area where the sheets are dispensed are at different 10 transversal distances d''a, d''b, d''c from one guide device to another, as may be inferred from Figure 4.

15 This greatly facilitates changeover from one size to another. It is sufficient to substitute the guide means 182 with other guide means suitable for another size. Thus, complicated and time-consuming changeover adjustments are minimized and made simpler than in prior art machines.

In particular, in addition to the guide means, the means for gripping and cutting the sheets must also be changed since they are mounted directly on the guide means.

20 The invention also contemplates the provision of advantageous means for joining the sheet 4 to the tear tapes 2 and 3. These joining means are embodied as respective sealing means that extend transversally in cantilever fashion from the partition wall 120 and are located at a position corresponding to and facing the upward facing sites on the horizontally positioned face 141 of the lateral surface of the means 14 that feed the wrapper parts.

25 The sealing means 20 move downwards to join the heat-sealable face of the sheet 4 to the tear tapes 2 and 3 and up again to a position where the feed means can turn freely.

30 The sealing means 20 are mounted downstream and, in particular, immediately downstream of the sheet 4 placing means 18 in the direction in which the feed means 14 advance.

Positioning the sealing plate 20 above the roller means 14 for feeding the wrapper parts enables the label magazines to extend over the sealing means 20, as explained in more detail below.

35 The sealing means 20 are located on the side of the feed means 14 opposite the side where the tear tape placing means are located.

The apparatus also advantageously comprises means 22 for placing a label, denoted by the reference numeral 5 in Figure 3, on a respective site on the wrapper

part feed means 14, and in particular, in such a way as to place the label 5 over the respective sheet 4.

Further, as illustrated in Figure 5, the label placing means 22 are mounted above the wrapper part feed means 14 and downstream and, in particular, 5 immediately downstream of the sealing means 20 and of the sheet 4 placing means, in the direction in which the wrapper parts are fed by said feed means 14.

The means 22 for placing a label on the respective sheet are also mounted on respective mounting means which extend transversally in cantilever fashion from the partition wall 120.

10 The label placing means comprise label accommodating means 122 in the form of a plurality of magazines 122a, 122b, 122c, 122d, extending in a straight line at an angle to the vertical and above the sealing means 20, as mentioned previously.

15 In practice, the placing means 22 place four labels on respective wrapper sites 141a, 141b, 141c, 141d.

The label placing means 22 comprise means 121 which pick up the label 5 from the accommodating means 122 and transfer it to the feed means 14, and which are in the form of corresponding revolving means that turn in the same direction as the wrapper part feed means 14.

20 The label placing means also comprise means 123 for dispensing an adhesive material to the labels 5 held by the label pickup and transfer means 121.

The label placing means thus comprise a revolving roller extending transversally from the wall 120 and having a plurality of transversally aligned sites - in particular, four transversally aligned sites – there being, for each single label 25 fed by the means 121, four operating positions, namely, a position where the label is picked up from the magazine, a position where adhesive is applied to it, an idle position and, lastly, a position where the label is transferred to the means 14 that feed all the wrapper parts. These operating positions correspond to 90° angular movements of the label roller.

30 In particular, the label roller has an outer surface with sites on it for accommodating the labels and comprising a surface on which the labels are supported and means for retaining the labels on the supporting surface. These retaining means are, in particular, embodied as suction means comprising holes in the area, or surface that supports the label, and conduits that put the suction holes at each site selectively in communication with a vacuum source. The suction holes and conduits are not illustrated in detail in the accompanying drawings.

In practice, the labels are placed on respective sites on the part of the

wrapper feed means 14 facing up and to one side of the feed means 14, in particular, facing the downstream section of the machine 10.

The label placing means 22 are located on the side of the feed means 14 opposite the side where the tear tape placing means 16 are located.

5 Means are also advantageously provided for creasing the respective sheets 4 at a respective site 141 of the means 14 for feeding the parts of the wrapper.

The creases 6, shown in Figure 3, are made in the sheet 4 in order to facilitate its subsequent folding into a shape suitable for receiving the product.

10 In the apparatus according to the invention, the creases 6 on the sheet are advantageously made when the latter is on the revolving feed means 14. This greatly simplifies the structure compared to prior art machines.

15 Also advantageously, the sheet creasing means, operating at 24 and not specifically illustrated in the accompanying drawings, are positioned alongside the wrapper part feed means 14 on the side of the latter opposite the side where the sheet 4 placing means are located.

In practice, the means for making at least one crease 6 on the sheets operate on the vertically oriented sites facing the downstream section of the machine.

20 Advantageously, the means for making a crease 6 on the sheet 4 are mounted, relative to the direction in which the wrapper parts are fed by said feed means 14, downstream and, in particular, immediately downstream of the label placing means 22 and also downstream of the means 18 that place the sheet 4 on the feed means 14.

25 Advantageously, the sheet creasing means also comprise four transversally aligned operating elements extending transversally in cantilever fashion from the partition means 120.

The wrapper creasing means, operating at 24, are located on the side of the feed means 14 opposite the side where the sheet placing means 18 are located.

According to another advantageous aspect, means 26 are provided for picking up the wrapper from a respective site on the wrapper part feed means 14.

30 These wrapper pickup means 26 are positioned alongside the wrapper part feed means and are designed to pick up the wrapper from the sites on the part of the feed means 14 facing down and to one side, that is to say, those facing the downstream section of the machine.

35 The wrapper pickup means 26 are located on the side of the feed means 14 opposite the side where the sheet placing means are located.

Advantageously, the wrapper pickup means are located immediately downstream of the creasing means 24 in the direction in which the wrapper parts

are fed by the feed means 14.

The wrapper pick up means take the form of a rocker element 26, which is pivoted in line with the roller 24a that advances the means for feeding the wrapper in the containing condition, that is to say, when the wrapper has been folded into a 5 cup-shaped shape, as may be inferred from Figure 5, and are designed to hold the wrappers at the top or engaging the top faces of the sheets after receiving them from first means, not illustrated in detail in the accompanying drawings, for picking up the sheets directly from the assembly roller and which hold them at the bottom or engage the bottom faces of the sheets.

10 The assembled wrappers 4 are thus delivered by the rocker elements 26 to downstream means for forming the wrapper, said sheets being applied or rested on a horizontal, or substantially horizontal surface of the forming means, also illustrated in Figure 6.

15 Upstream of the wrapper part feed means 14 means are provided for feeding the film 1 from which the wrappers are made.

Advantageously, these film 1 feed means, labelled 30 in the drawings, extend transversally from the frame partition means 120.

20 In practice, the film feed means comprise a transversal shaft 30 that mounts a roll 31 into which the transversal shaft 30 extends from the longitudinal wall 120 from which the other operating means of the apparatus also extend, in particular, the assembly means 14 and the related means for placing the parts of the wrapper.

Thus, the operator has all the operating parts of the machine in front of him/her and can easily supervise operations and take prompt action when necessary, for example when the roll 31 needs to be changed.

25 Advantageously, the level at which the film feed means 30 extend above the supporting surface of the apparatus 10 is lower than the level occupied by the means 14 that feed the wrapper parts.

30 Advantageously, the film feed means 30 rotate in clockwise direction and comprise respective transmission means 32 positioned above the shaft 30 and designed to make the film 1 unwound from the roll 31 follow a vertical or substantially vertical path. The transmission means are embodied as rollers 32 located between the roll mounting shaft 30 and the wrapper part feed means 14.

35 As illustrated, the sheet 4 placing means 18, which are mounted on the side facing the end upstream of the assembly means 14, are also located between the latter and the wrapper sheet web feed area.

Means are also advantageously provided for shaping the wrapper, said means being designed to form a cup-shaped container suitable for receiving the

product portion.

The wrapper shaping means comprise forming means 40 and means 42 for pushing the wrapper into the forming means 40.

More specifically, the shaping means comprise hoppers 40 having a vertical, or axial, open-ended cavity of suitable size and designed to give the wrapper a cup-shaped shape, each of these hoppers being of a type well known to experts in the trade.

The shaping means 40 are mounted on respective mounting means which extend transversally in cantilever fashion from the partition means 120.

10 The means 42 that push the flat sheets into the hoppers – there being four hoppers aligned with each other and fixedly connected to the partition wall 120 – in turn comprise respective pistons 42 that move vertically between a raised position that enables the still flat sheets to be placed in position above the hoppers, and a lowered position in which the pistons extend downwardly past the bottoms 15 of the shaping hoppers.

This pushing movement of the pistons gives the wrapper sheets a cupped shape and causes them to be placed on respective means, labelled 44 in their entirety in the drawings, which feed the cup-shaped wrappers lengthways and which extend under the hoppers 40.

20 The pushing means 42 are also mounted on respective mounting means which extend transversally in cantilever fashion from the partition means 120, in a position above the hoppers 40.

As just mentioned, means 44 are provided for feeding the cup-shaped wrappers lengthways.

25 The means for feeding the cup-shaped wrappers lengthways comprise supporting means, or pockets, 46 – four parallel rows of transversally aligned pockets being provided – mounted on respective belt means 48, in particular comprising a first and a second lateral belt 48a and 48b, forming an endless belt of pockets 46 driven by respective wheels 46a, 46b which are in turn driven and supported by shafts protruding from the transversal wall 120.

The belts 48a, 48b mount transversal blocks that support a plurality of pockets 46, four in this embodiment, for accommodating the shaped wrapper sheets.

35 The mounting shafts for the wheel 46a, 46b that support and feed the belt 44 also constitute mounting means that extend transversally in cantilever fashion from the partition wall 120.

Means 50 are also provided for filling the wrapper, said means 50 being

mounted on means which protrude transversally from the partition means 120.

In particular, the filling means 50 comprise a plurality of nozzles – in this embodiment, four nozzles – for dispensing the pasty product and which, as illustrated, are transversally aligned with each other.

5 Means, labelled 52 in their entirety in the accompanying drawings, are also provided for applying a cap on the wrapper, said means being located immediately downstream of the product dispensing means 50 and, like the dispensing means 50, being positioned above the belt 44 that feeds the cup-shaped containers.

10 The cap application means 52 are mounted on respective mounting means which extend transversally in cantilever fashion from the partition means 120.

The cap application means 52 can also be moved between a working position and a different position where they can be easily cleaned.

In particular, the cap application means can be moved between a lowered working position and a raised position, illustrated in Figure 2.

15 The means for mounting the cap application means 52 have a fixed part, not illustrated in Figure 2, and a mobile part, labelled 152, which extends transversally of the apparatus and is pivotally mounted in such a way that it can swing on the fixed part at the partition wall 120.

20 Means 54 are also provided for folding the cap retaining tabs. As known, the cap retaining tabs are the ends of the wrapper that extend above the product portion inside the wrapper and which are folded over the cap in such a way as to retain it.

25 As illustrated, the means 54 for folding the cap retaining tabs are mounted on respective mounting means which extend transversally in cantilever fashion from the partition means 120.

The means 54 for folding the cap retaining tabs can move from a lowered working position and a second, raised position where they can, for example, be cleaned, as illustrated in Figure 2.

30 Means are provided for mounting the means 54 that fold the cap retaining tabs, said mounting means having a fixed part 154 and a mobile part 155 that moves relative to the fixed part 154.

In particular, the mobile part 155 extends transversally of the apparatus 10 and swings from the fixed part on pivoting means 155a at the longitudinal partition wall 120.

35 Means 56 are also provided for sealing the retaining tabs to the cap under them.

The means for sealing the retaining tabs to the cap are mounted on

respective mounting means which extend transversally in cantilever fashion from the partition means 120.

In particular, the means 56 for sealing the retaining tabs to the cap can be moved between a lowered position and a second position. More specifically, the 5 means for sealing the retaining tabs to the cap can be moved between a lowered working position, that is to say, the position where they seal the tabs to the cap, and a raised position where the respective sealing plates 156' can be cleaned.

The means for mounting the sealing plate 156' comprise a fixed part 156 and a part 157 that is mobile relative to the fixed part 156. In particular, the 10 mobile part 157 extends transversally of the apparatus and swings from the fixed part on pivoting means 156a at the longitudinal partition wall 120.

Means 147 are provided for positioning the cup-shaped, filled wrapper at a height such that the top of the product is at a predetermined, desired height.

The means 147 for positioning the wrapper in height are embodied as 15 longitudinal guide means 147 located at the wrapper feed means 44.

The guide means 147 for lifting the cup-shaped wrapper are located at the wrapper feed means 44.

As illustrated, the wrapper holding means 46 comprise, for supporting the bottom of the wrapper, a base 146a having an extension 146b that protrudes downwardly through a respective conduit 46' under the fixed part of the wrapper holding means or blocks 46, said downwardly protruding extension 146b having a bottom contact end 146'b that runs in the guide means 147.

By sliding in the guide means, the height of the wrapper can be suitably adjusted to fold the cap retaining tabs in such a way as to obtain a "sharp" edge or a "soft" edge, that is to say a straight edge or a more rounded edge, according to 25 packaging requirements.

The means 147 for positioning the wrapper in height are removably connected to the apparatus and, more specifically, the invention contemplates the provision of a plurality of means 147 for positioning the wrapper in height, 30 selectable according to requirements.

The removable connecting means consist of screws and brackets labelled 148 and 149 in Figure 6.

In particular, the guide means 147 are embodied as respective longitudinal bars with suitably shaped top ends 147a. More specifically, there are four 35 transversally aligned bars for driving the mobile bases or means 146a that lift the wrapper being formed.

The mounting means of the height positioning means 147 also extend

transversally of the partition wall 120.

Downstream of the cap sealing means, in an area labelled 58 in Figure 1, respective means may be provided for grouping the packages.

The invention described above is susceptible of industrial application and 5 may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A packaging apparatus (10), in particular for food products, especially pasty food products such as processed cheese, stock cubes, butter, margarine and the like, to be wrapped preferably in a suitable wrapper, the apparatus comprising a mounting frame (12), operating means for preparing the package and means for driving said operating means, the apparatus being characterized in that the mounting frame (12) comprises partition means (120) which extend lengthways along the apparatus, and from which the corresponding operating means in turn extend and which separate the operating means from the drive means.
5
2. The apparatus according to claim 1 or according to the preamble to claim 1, characterized in that it comprises a longitudinal wall (120) that separates corresponding operating means from the respective drive means.
15
3. The apparatus according to either of the foregoing claims, characterized in that it comprises a flat wall (120) that separates corresponding operating means from the respective drive means.
- 20 4. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means (14) for feeding the parts of the wrapper.
5. The apparatus according to claim 4, characterized in that the wrapper part feed means (14) are means that revolve about a horizontal or substantially horizontal axis (O).
- 25 6. The apparatus according to claim 4 or 5, characterized in that the means (14) for feeding the parts of the wrapper rotate in clockwise direction (W).
- 30 7. The apparatus according to any of the foregoing claims from 4 to 6, characterized in that the means (14) for feeding the parts of the wrapper move with alternating motion.
- 35 8. The apparatus according to any of the foregoing claims from 4 to 7, characterized in that the means (14) for feeding the parts of the wrapper comprise

a plurality of circumferentially distributed sites designed to accommodate the wrapper parts.

9. The apparatus according to any of the foregoing claims from 4 to 8,
5 characterized in that the means (14) for feeding the parts of the wrapper comprise
a plurality of transversally aligned sites for accommodating the wrapper parts.

10. The apparatus according to any of the foregoing claims from 4 to 9,
characterized in that the means (14) for feeding the parts of the wrapper comprise
10 a revolving body defining a plurality of circumferentially distributed sites (141)
for accommodating the wrapper parts.

11. The apparatus according to any of the foregoing claims from 4 to 10,
characterized in that the means (14) for feeding the parts of the wrapper extend
15 transversally from the partition means (120).

12. The apparatus according to any of the foregoing claims from 4 to 11,
characterized in that sites for accommodating the wrapper parts are provided, said
sites comprising a surface (145) for supporting the parts and means for retaining
20 the parts on the supporting surface (145).

13. The apparatus according to claim 12, characterized in that the means for
retaining the parts on the supporting surface (145) comprise suction means.

25 14. The apparatus according to any of the foregoing claims from 4 to 13,
characterized in that the means (14) for feeding the parts of the wrapper can be
removably associated with the apparatus.

30 15. The apparatus according to any of the foregoing claims from 4 to 14,
characterized in that it comprises a plurality of means (14) for feeding the parts of
the wrapper.

35 16. The apparatus according to any of the foregoing claims or according to the
preamble to claim 1, characterised in that it comprises means (16) for placing tear
tape means (2, 3) on respective sites of the wrapper part feed means (14).

17. The apparatus according to claim 16, characterized in that the tear tape placing means (16) comprise means (161a, 161b, 161c, 161d) for placing a respective first tear tape (2).

5 18. The apparatus according to claim 17, characterized in that the tear tape placing means (16) comprise means (162a, 162b, 162c, 162d) for placing a respective second tear tape (3).

10 19. The apparatus according to any of the foregoing claims from 16 to 18, characterized in that the means (16) for placing the tear tape means (2, 3) are located under the means (14) for feeding the parts of the wrapper.

15 20. The apparatus according to claim 18 or 19, characterized in that the means (162a, 162b, 162c, 162d) for placing a second tear tape are, relative to the direction in which the wrapper parts are fed by the feed means (14), mounted downstream of the means (161a, 161b, 161c, 161d) that place the first tear tape.

20 21. The apparatus according to claim 20, characterized in that the means (162a, 162b, 162c, 162d) for placing a second tear tape (3) are, relative to the direction in which the wrapper parts are fed by the feed means, mounted downstream of the means (161a, 161b, 161c, 161d) that place the first tear tape (2), so that the second tear tape is placed on a site immediately downstream of the site for the first tear tape.

25 22. The apparatus according to any of the foregoing claims from 16 to 21, characterized in that the means (16) for placing the tear tape means are mounted on respective mounting means that extend transversally from the partition means (120).

30 23. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (18) for placing the sheet (4) constituting the main body of the wrapper on a respective site of the means (14) for feeding the parts of the wrapper.

35 24. The apparatus according to claim 23, characterized in that the means (18) for placing the sheet (4) are, relative to the direction in which the wrapper parts are fed by the feed means, mounted downstream of the tear tape placing means.

25. The apparatus according to claim 23 or 24, characterized in that the means (18) for placing the sheet are, relative to the direction in which the wrapper parts are fed by the feed means, mounted in such a way that the sheet is placed on a site 5 that is immediately downstream of a site where no operation is performed.

26. The apparatus according to any of the foregoing claims from 23 to 25, characterized in that the sheet placing means (18) comprise means for gripping the sheets and means (182) for guiding the gripper means. 10

27. The apparatus according to claim 26, characterized in that the means for guiding the gripper means have a plurality of guide means (182a, 182b, 182c, 182d) for respective gripper means.

28. The apparatus according to claim 27, characterized in that the means for 15 guiding the gripper means have a plurality of diverging guide means (182a, 182b, 182c, 182d) for respective gripper means.

29. The apparatus according to any of the foregoing claims from 26 to 28, characterized in that the means (182) for guiding the gripper means can be 20 removably associated with the apparatus.

30. The apparatus according to any of the foregoing claims from 26 to 29, characterized in that it comprises a plurality of the means (182) for guiding the gripper means. 25

31. The apparatus according to any of the foregoing claims from 26 to 30, characterized in that the sheet gripping means (18) are mounted on the guide means and can be removed with the latter. 30

32. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (20) for joining the sheet (4) and the tear tape means (2, 3).

33. The apparatus according claim 32, characterized in that the joining means (20) are mounted above the means that feed the parts of the wrapper. 35

34. The apparatus according to claim 32 or 33, characterized in that the joining means (20) are, relative to the direction in which the wrapper parts are fed by the feed means, mounted downstream of the sheet placing means (18).

5 35. The apparatus according to claim 34, characterized in that the joining means (20) are, relative to the direction in which the wrapper parts are fed by the feed means, mounted downstream of the sheet placing means (18), so that the joining operation takes place on a site immediately downstream of the site that receives the respective sheet (4).

10 36. The apparatus according to any of the foregoing claims from 32 to 35, characterized in that the joining means (20) are mounted on respective mounting means that extend transversally from the partition wall (120).

15 37. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (22) for placing a label (5) on a respective site of the means (14) for feeding the parts of the wrapper.

20 38. The apparatus according to claim 37, characterized in that the means (22) for placing the label (5) are mounted above the means (14) that feed the parts of the wrapper.

25 39. The apparatus according to claim 37 or 38, characterized in that the label placing means (22) are, relative to the direction in which the wrapper parts are fed by the feed means (14), mounted downstream of the sheet placing means.

30 40. The apparatus according to any of the foregoing claims from 37 to 39, characterized in that the label placing means (22) are mounted on respective mounting means that extend transversally from the partition wall (120).

41. The apparatus according to any of the foregoing claims from 37 to 40, characterized in that the label placing means (22) comprise means (122) for accommodating the labels.

35 42. The apparatus according to claim 41, characterized in that the means (122) that accommodate the labels are mounted above the joining means (20).

43. The apparatus according to any of the foregoing claims from 37 to 42, characterized in that the label placing means (22) comprise means (121), in the form of revolving means, which pick up the labels from the accommodating means (122) and transfer them to the means (14) that feed the parts of the wrapper.

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44. The apparatus according to any of the foregoing claims from 37 to 43, characterized in that the label placing means (22) comprise means (123) for dispensing an adhesive material to the labels positioned on the label pick up and transfer means (121).

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45. The apparatus according to any of the foregoing claims from 37 to 44, characterized in that the means (22) for placing the label are, relative to the direction in which the wrapper parts are fed by the feed means, mounted in such a way that the label is placed on a site that is immediately downstream of the site for the first tear tape on which the joining means (20) operate.

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46. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (24) for creasing the respective sheet at a respective site of the means (14) for feeding the parts of the wrapper.

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47. The apparatus according claim 46, characterized in that the means (24) for creasing the sheet are mounted alongside the means (14) that feed the parts of the wrapper.

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48. The apparatus according to claim 46 or 47, characterized in that the means (24) for creasing the sheet are mounted on the side of the wrapper part feed means (14) opposite the side where the sheet placing means are located.

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49. The apparatus according to any of the foregoing claims from 46 to 48, characterized in that the means (24) for making a crease (6) on the sheet (5) are, relative to the direction in which the wrapper parts are fed by the feed means (14), mounted downstream of the label placing means (22).

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50. The apparatus according to claim 49, characterized in that the sheet creasing means (24) are, relative to the direction in which the wrapper parts are fed by the

feed means (14), mounted in such a way that creasing takes place on a site immediately downstream of the site where the label (5) is placed.

51. The apparatus according to any of the foregoing claims from 46 to 50, characterized in that the means (24) for creasing the sheet are mounted on respective mounting means that extend transversally from the partition means (120).

52. The apparatus according to any of the foregoing claims or according to the 10 preamble to claim 1, characterised in that it comprises means (26) for picking up the wrapper from a respective site of the means (14) that feed the parts of the wrapper.

53. The apparatus according claim 52, characterized in that the means (26) for 15 picking up the wrapper are mounted alongside the means (14) that feed the parts of the wrapper.

54. The apparatus according to claim 52 or 53, characterized in that the means (26) for picking up the wrapper are mounted on the side of the wrapper part feed 20 means (14) opposite the side where the sheet placing means (18) are located.

55. The apparatus according to any of the foregoing claims from 52 to 54, characterized in that the means (26) for picking up the wrapper are, relative to the direction in which the wrapper parts are fed by the feed means, mounted 25 downstream of the creasing means.

56. The apparatus according to claim 55, characterized in that the wrapper pickup means (26) are, relative to the direction in which the wrapper parts are fed by the feed means, mounted in such a way as to pick up the wrapper from a site immediately downstream of the site where the creasing means (24) operate.

57. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means for feeding the film (1) from which the wrapper sheet is obtained.

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58. The apparatus according to claim 57, characterized in that the means for feeding the film from which the wrapper sheet is obtained comprise a transversal

shaft (30) which mounts a respective roll and which extends from the partition means (120).

5 59. The apparatus according to claim 57 or 58, characterized in that the film feed means (30) extend at a level lower than the wrapper part feed means (14).

60. The apparatus according to any of the foregoing claims from 57 to 59, characterized in that the film feed means rotate in clockwise direction.

10 61. The apparatus according to any of the foregoing claims from 57 to 60, characterized in that the film feed means comprise transmission means (32) that make the film (1) unwound from the roll (31) follow a vertical or substantially vertical path in an upward direction.

15 62. The apparatus according to any of the foregoing claims from 23 to 61, characterized in that the means (18) for placing the sheet (4) are located alongside the means for feeding the parts of the wrapper.

20 63. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means for shaping the wrapper.

25 64. The apparatus according to claim 63, characterized in that the wrapper shaping means comprise means (40) for forming the wrapper and means (42) for pushing the wrapper into the forming means (40).

30 65. The apparatus according to claim 64, characterized in that the wrapper forming means are embodied as open-ended hopper means (40) having an axial opening designed to shape the wrapper.

66. The apparatus according to claim 64 or 65, characterized in that the means (40) for forming the wrapper are mounted on respective mounting means that extend transversally from the partition means (120).

35 67. The apparatus according to any of the foregoing claims from 64 to 66, characterized in that the means (42) for pushing the wrapper into the forming

means (40) are embodied as piston means that move vertically between a raised position and a lowered position.

68. The apparatus according to any of the foregoing claims from 64 to 67,
5 characterized in that the pushing means (42) are mounted on respective mounting means that extend transversally from the partition means (120).

69. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means (44) for feeding the 10 cup-shaped wrapper lengthways.

70. The apparatus according to claim 69, characterized in that the means (44) for feeding the cup-shaped wrappers are mounted on respective mounting means that extend transversally from the partition means (120).

15 71. The apparatus according to claim 69 or 70, characterized in that the means for feeding the cup-shaped wrappers comprise pockets (46) and lateral belts (48a, 48b) for mounting the pockets.

20 72. The apparatus according to any of the foregoing claims from 69 to 71, characterized in that the means (26) for picking up the wrapper are mounted on the means (44) that feed the cup-shaped wrappers.

25 73. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means (50) for filling the wrapper.

30 74. The apparatus according to claim 73, characterized in that the means (50) for filling the wrapper comprise mounting means that extend transversally from the partition means (120).

75. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means (52) for applying a cap on the wrapper.

76. The apparatus according to claim 75, characterized in that the cap application means (52) are mounted on respective mounting means that extend transversally from the partition means (120).

5 77. The apparatus according to claim 75 or 76, characterized in that the cap application means (52) move between a working position and a second position.

10 78. The apparatus according to any of the foregoing claims from 75 to 77, characterized in that the cap application means (52) move between a lowered position and a raised position.

15 79. The apparatus according to any of the foregoing claims from 75 to 78, characterized in that it comprises means for mounting the cap application means (52) and which have a fixed part and a part (152) that moves relative to the fixed part.

20 80. The apparatus according to any of the foregoing claims from 75 to 79, characterized in that the means for mounting the cap application means have a mobile part (152) that extends transversally of the apparatus (10).

25 81. The apparatus according to claim 79 or 80, characterized in that the mobile mounting means (152) swing on pivoting means at the partition wall (120).

82. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (54) for folding the cap retaining tabs.

30 83. The apparatus according to claim 82, characterized in that the means (54) for folding the cap retaining tabs are mounted on respective mounting means that extend transversally from the partition means (120).

84. The apparatus according to claim 82 or 83, characterized in that the means (54) for folding the cap retaining tabs move between a working position and a second position.

85. The apparatus according to any of the foregoing claims from 82 to 84, characterized in that the means (54) for folding the cap retaining tabs move between a lowered position and a raised position.

5 86. The apparatus according to any of the foregoing claims from 82 to 85, characterized in that it comprises means for mounting the means (54) that fold the cap retaining tabs, said mounting means having a fixed part (154) and a part (155) that moves relative to the fixed part (154).

10 87. The apparatus according to any of the foregoing claims from 82 to 86, characterized in that the means for mounting the cap application means have a mobile part (155) that extends transversally of the apparatus (10).

15 88. The apparatus according to claim 86 or 87, characterized in that the mobile mounting means (155) swing on pivoting means at the partition wall (120).

89. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means (56) for sealing the retaining tabs to the cap.

20 90. The apparatus according to claim 89, characterized in that the means (56) for sealing the retaining tabs to the cap are mounted on respective mounting means that extend transversally from the partition means (120).

25 91. The apparatus according to claim 89 or 90, characterized in that the means (56) for sealing the retaining tabs to the cap move between a working position and a second position.

30 92. The apparatus according to any of the foregoing claims from 89 to 91, characterized in that the means (56) for sealing the retaining tabs to the cap move between a lowered position and a raised position.

93. The apparatus according to any of the foregoing claims from 89 to 92, characterized in that it comprises means for mounting the means (56) that seal the retaining tabs to the cap, said mounting means having a fixed part (156) and a part (157) that moves relative to the fixed part (156).

94. The apparatus according to any of the foregoing claims from 89 to 93, characterized in that the means (56) for sealing the retaining tabs to the cap have a mobile part (157) that extends transversally of the apparatus (10).

5 95. The apparatus according to claim 93 or 94, characterized in that the mobile mounting means (157) swing on pivoting means (156a) at the partition wall (120).

10 96. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that it comprises means (147) for positioning the cup-shaped, filled wrapper at a height such that the top of the product is at a predetermined height.

15 97. The apparatus according to claim 96, characterized in that the means (147) for positioning the wrappers in height comprise respective guide means.

98. The apparatus according to claim 96 or 97, characterized in that the means (147) for positioning the cup-shaped, filled wrappers in height extend at the wrapper feed means.

20 99. The apparatus according to claims 95 to 98, characterized in that the means (147) for positioning the cup-shaped, filled wrappers in height extend under the wrapper holding means (46).

100. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterized in that the wrapper holding means (46) comprises mobile means (146a) which support the wrappers and which act in conjunction with respective guide means (147).

25 101. The apparatus according to any of the foregoing claims from 96 to 100, characterized in that the means (147) for positioning the wrappers in height can be removably associated with the apparatus.

102. The apparatus according to any of the foregoing claims from 96 to 101, characterized in that it comprises a plurality of means (147) for positioning the cup-shaped, filled wrappers in height, corresponding to different wrapper heights.

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103. The apparatus according to any of the foregoing claims from 96 to 102, characterized in that the means for positioning the cup-shaped, filled wrappers in height are embodied as suitably shaped longitudinal bars (147).

5 104. The apparatus according to any of the foregoing claims from 96 to 103, characterized in that the means (147) for positioning the cup-shaped, filled wrappers in height means are mounted on respective mounting means that extend transversally from the partition means (120).

10 105. The apparatus according to any of the foregoing claims or according to the preamble to claim 1, characterised in that it comprises means for grouping the packages.

15 106. The apparatus according to any of the foregoing claims, characterized in that it comprises means for support on the floor and protruding transversally from the partition means (120).

20 107. The apparatus according to claim 106, characterized in that the means for support on the floor comprise a plurality of feet (124, 125, 126) distributed lengthways.

108. The apparatus according to claim 106 or 107, characterized in that the means (124, 125, 126) for support on the floor extend under the respective operating means.

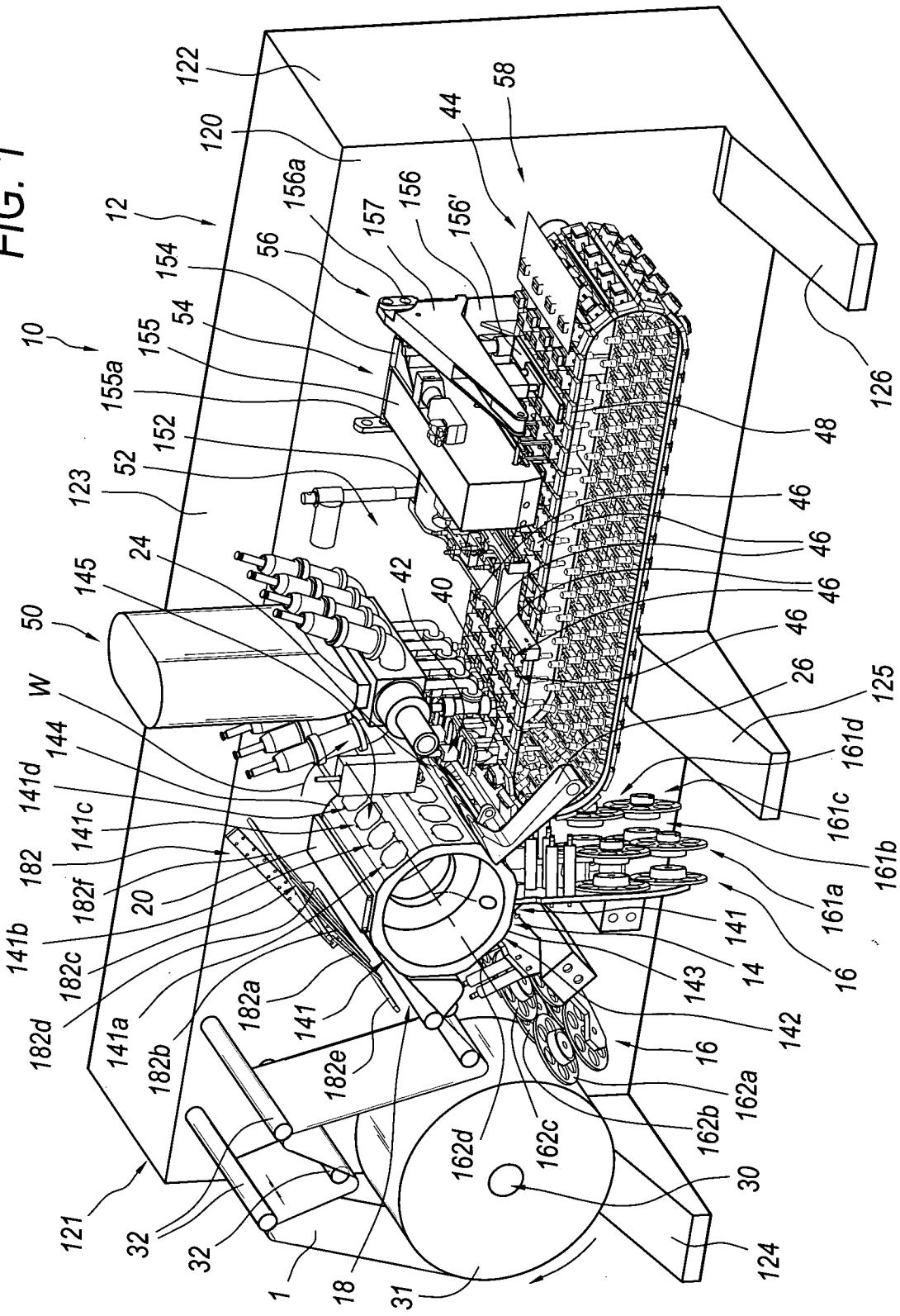
25 109. The apparatus according to any of the foregoing claims from 26 to 108, characterized in that the sheet cutting means are mounted on the means for guiding the sheet gripper means.

30 110. The apparatus according to any of the foregoing claims from 37 to 109, characterized in that the means for dispensing the adhesive material to the labels operate on the side of the label feed means opposite that where the labels are transferred to the wrapper feed means (14).

35 111. The apparatus according to any of the foregoing claims, characterised in that the respective operating extend in cantilever fashion from the partition means (120).

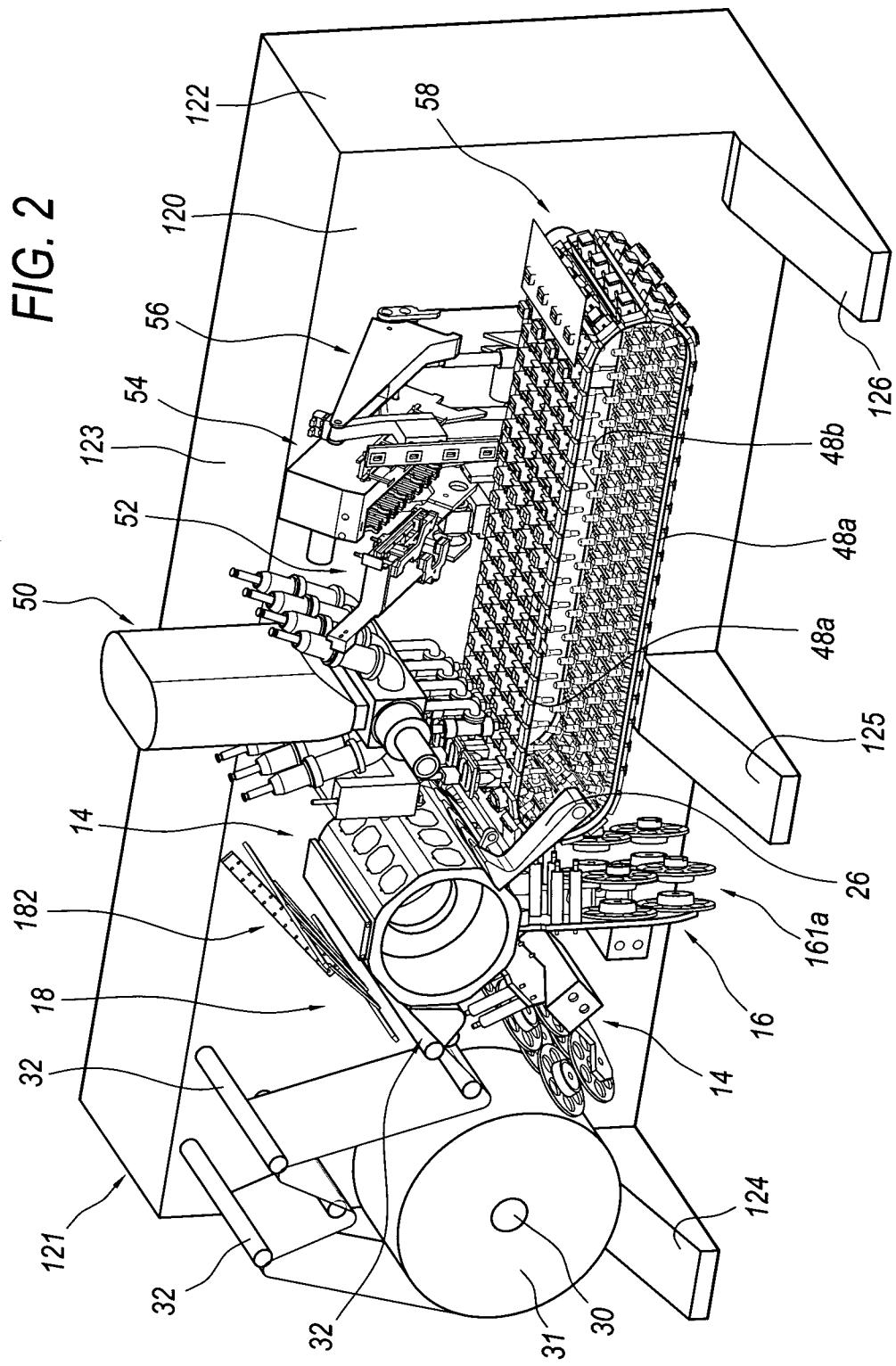
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FIG. 1

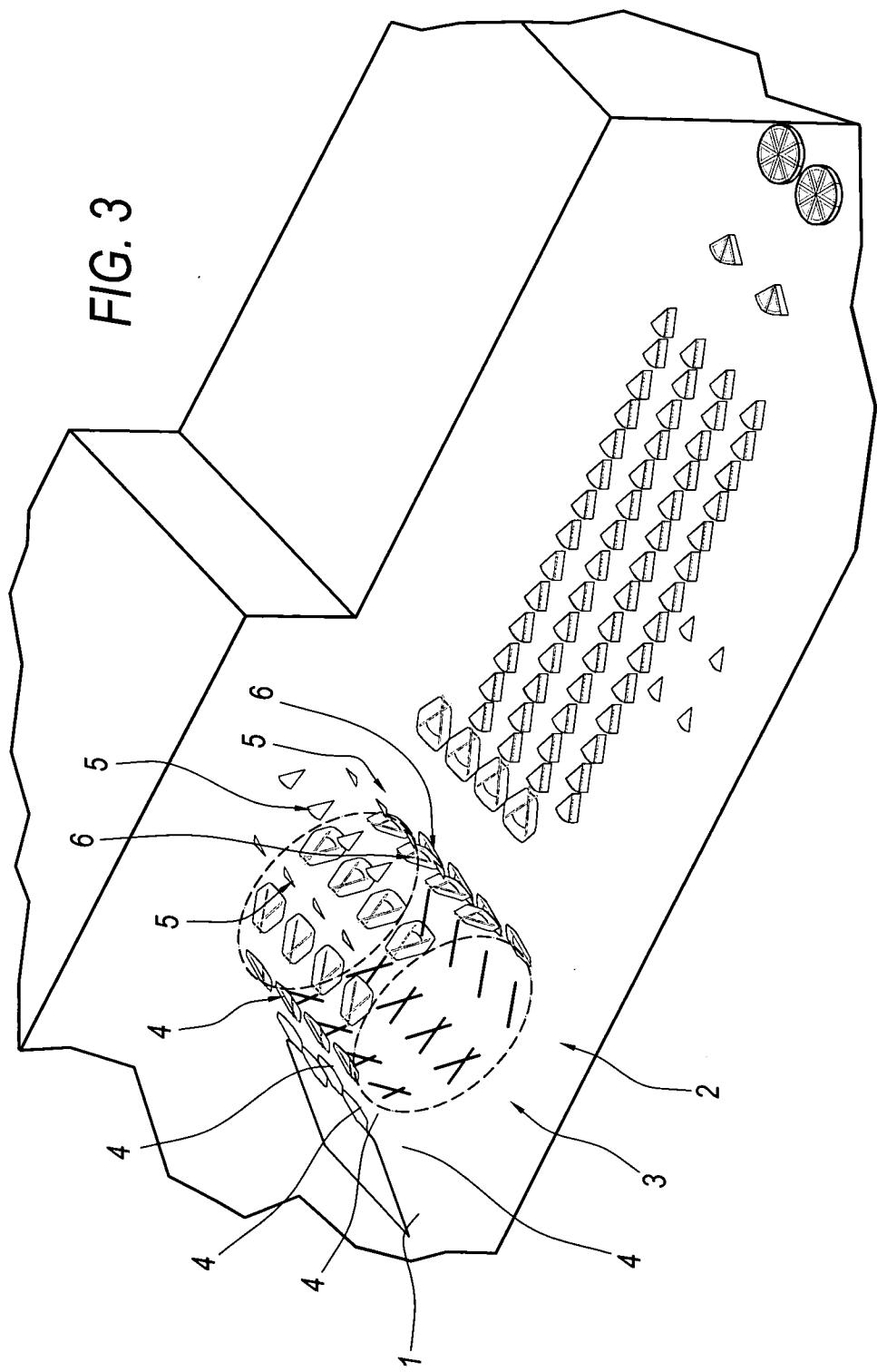


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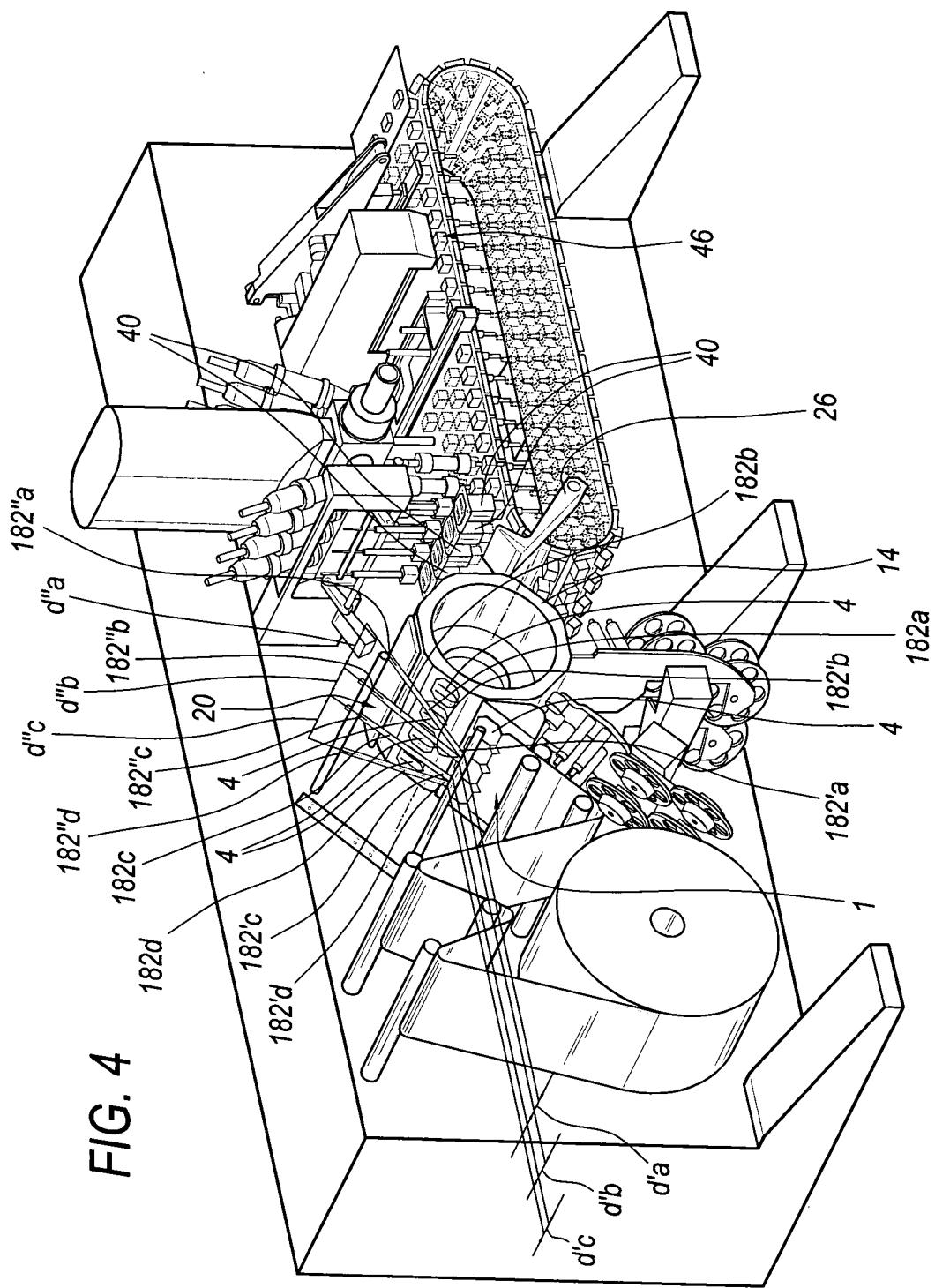
FIG. 2



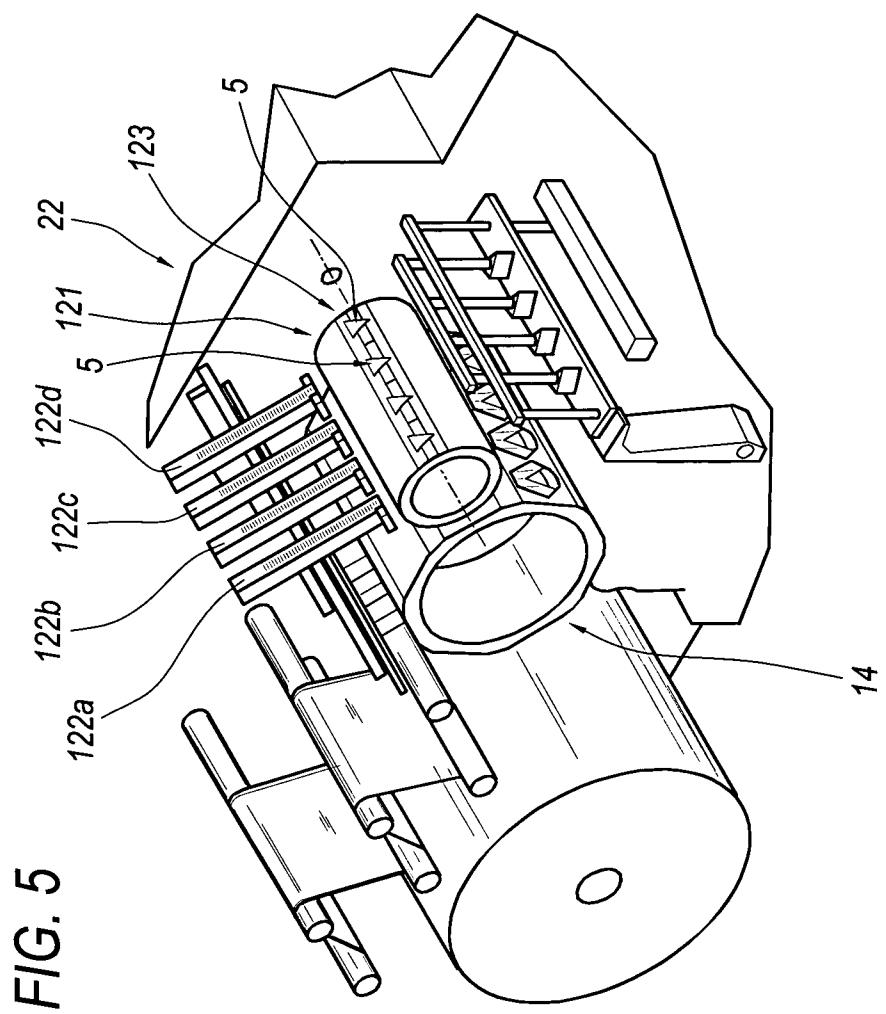
3/6



4/6



5/6



6/6

FIG. 6

