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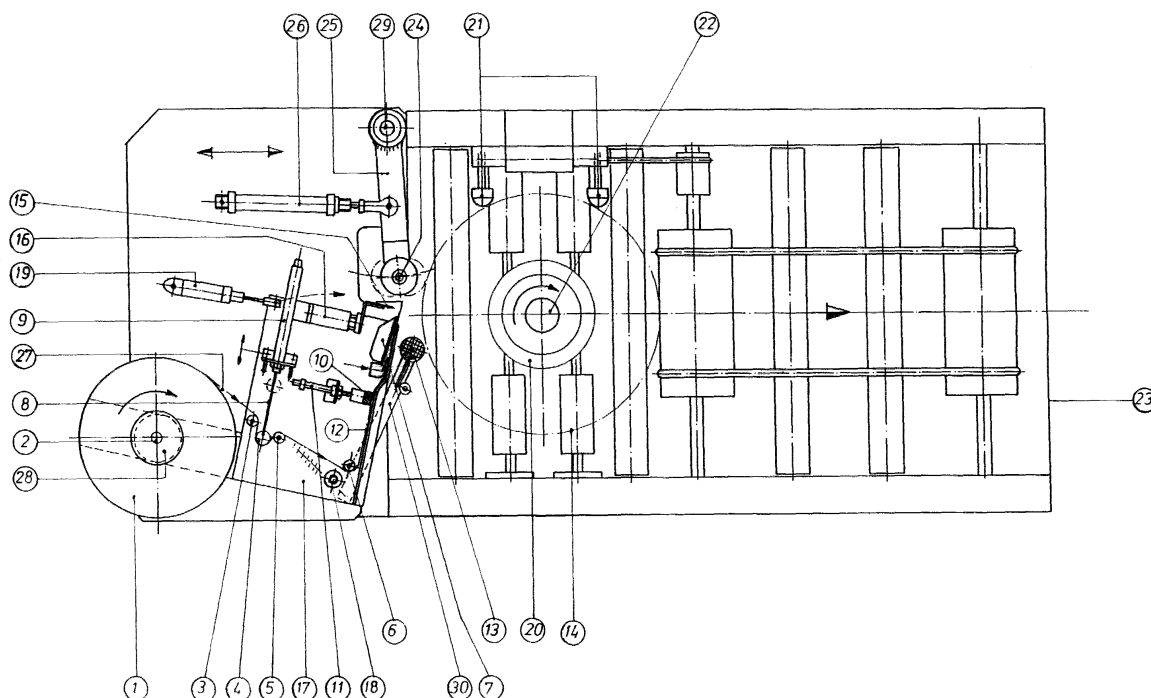
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(54) **Device for applying a banderole to cheeses**

(57) In a device for applying a banderole (27) to the circumference of a rotating cheese (14), which device comprises rotation means for rotating the cheese, a strip-application device (7) for applying a banderole strip to the circumference of the rotating cheese (14), a pressure-exerting member (24) for pressing the banderole strip which has been supplied by the strip-application device (7) onto the cheese, a holding member (2) for

holding a banderole stock reel (1), guide means (6) for guiding the banderole off the banderole stock reel (1) towards the strip-application device (7) and cutting means (15) for cutting off the banderole strip between the strip-application device (7) according to the invention the rotation means comprise a vacuum turntable (20) with vacuum means for retaining and positioning the cheese, thus reducing damage to in particular wet cheeses which have just been plasticized.



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Description

[0001] The invention relates to a device for applying a banderole to the circumference of a rotating cheese, which device comprises rotation means for rotating the cheese, a strip-application device for applying a banderole strip to the circumference of the rotating cheese, a pressure-exerting member for pressing the banderole strip which has been supplied by the strip-application device onto the cheese, a holding member for holding a banderole stock reel, guide means for guiding the banderole off the banderole stock reel towards the strip-application device and cutting means for cutting off the banderole strip between the strip-application device and rotation means.

[0002] A device of this type which is of relatively simple design is known, for example, from Dutch patent publication 1010759. In this known device, a cheese to which a banderole is to be applied is positioned and centred on a turntable. In this known device according to the invention, unwinding means are used, which unwind a flap length from the banderole stock reel, which length is greater than or equal to the distance between the strip-application device and the pressure-exerting member in the active position thereof. In this way, it is always possible to supply the desired length of banderole to the strip-application device and to guide it past the pressure-exerting member, so that it can then be applied to the circumference of the rotating cheese. In combination with the pressure-exerting member, the rotating cheese pulls the banderole onwards until approximately one revolution has been completed, after which the strip is cut off and the free end is pressed onto the cheese by means of the pressure-exerting member, so that the entire circumference (with a small overlap) is provided with a banderole.

[0003] In this known device, a vertically movable turntable is used to support the cheese, so that after it has been centred and before the application of the banderole, the cheese can be engaged by a pressure-exerting or retaining member which is arranged at a fixed position above the turntable and can rotate freely, in order to be able to withstand the rotational forces which occur during the application of the banderole and to prevent the centred position from being lost.

[0004] When this known device is used for applying a banderole to wet cheese which has just been provided with a thin coating of cheese plastic, an application which is increasingly in demand, it has been found that the plastic layer may be damaged, which is unacceptable with a view to shelf life in connection with mould being formed, quality and shape.

[0005] It is an object of the present invention to provide a device for applying a banderole to cheeses in which the risk of damage, in particular to wet cheese which has just been coated with cheese plastic, is reduced.

[0006] According to the invention, to this end the de-

vice of the type described above is characterized in that the rotation means comprise a vacuum turntable with vacuum means for retaining and positioning the cheese. In the device according to the invention, a turntable to which a vacuum function has been added is used instead of the combination of a conventional turntable with pressure-exerting member arranged above it. In this way, damage to the cheese as a result of friction between cheese and rotation means is effectively prevented. As a result of the application of vacuum, the cheese is also subjected to sufficient suction to be able to withstand the rotational forces and the forces exerted on the circumference of the cheese by the pressure-exerting roller, and since there is no possibility of the cheese moving with respect to the upper surface of the turntable, the centred position is thus retained.

[0007] In the case of the vacuum turntable, the upper surface of the turntable, on which the cheese to which the banderole is to be applied is positioned, may be provided with a large number of perforations which are connected to a vacuum source via a suitable distribution element. A vacuum cup is another suitable embodiment. There is then no need for the pressure-exerting or retaining member which is arranged at a fixed position.

[0008] A further embodiment of the vacuum turntable comprises a conventional turntable with a freely rotatable retaining member positioned above it which is provided with one or more suction nozzles which are connected to a vacuum source.

[0009] The device according to the invention preferably comprises unwinding means in accordance with the abovementioned Dutch patent, which is hereby incorporated in its entirety by reference.

[0010] In particular, the unwinding means comprise two rollers, which are arranged at a fixed position and can rotate freely about a vertical axis, and a length adjustment roller, which is arranged so that it can move substantially between the said rollers. The banderole, which is guided over these three rollers from the banderole stock reel, can be unwound in accordance with the desired length as a result of the movable length adjustment roller being moved away from the freely rotatable rollers by a distance which amounts to almost half the distance between the strip-application device and the pressure-exerting member. Unwinding means of this type allow a compact structure of the device according to the invention. The movably arranged length adjustment roller is advantageously attached to the head of a piston of a piston/cylinder assembly. The stroke length of the piston of this piston/cylinder assembly is preferably adjustable, so that the banderole-application device according to the invention is suitable for applying a banderole strip to the circumference of cheeses of different diameters, while the distance between strip-application device and the pressure-exerting member can vary in the active position.

[0011] The unwinding means furthermore preferably comprise a blocking device for blocking the displace-

ment of a banderole, which blocking device is arranged in front of the strip-application device, as seen in the direction of movement of the banderole. This blocking device can act on the banderole, so that while the desired flap length is being unwound from the banderole stock reel, the free end of the banderole, which is situated in or beyond the strip-application device, cannot move back as a result of the tensile force exerted on it, which would otherwise lead to the banderole being unwound incorrectly.

[0012] A preferred embodiment of the blocking device comprises a piston/cylinder assembly and a pressure-exerting plate which is arranged at a distance from the head of the piston of this assembly. The banderole is passed through between the head of the piston and the pressure-exerting plate. To prevent the banderole from moving, the head is pressed against the banderole and the pressure-exerting plate, so that the banderole is clamped in place. To prevent the banderole, which is pulled by the other unwinding means during unwinding, from slipping, the head of the piston of the piston/cylinder assembly is advantageously provided with a nonslip material for the banderole, such as for example a rubber coating.

[0013] The strip-application device is preferably a guide plate, along which, if desired, compressed air is blown in order to place the end of the banderole between the pressure-exerting member and the cheese to which a banderole is to be applied.

[0014] The device according to the invention furthermore preferably comprises a feed member for wetting the circumference of the cheese before the banderole strip is brought into contact with the cheese. This wetting may be necessary in order to stick the banderole strip to the cheese and to connect the ends of the banderole strip to one another. The wetting agent used may be water, a starch or plastic polymer emulsion or other suitable adhesive which is acceptable for use with foodstuffs.

[0015] To ensure free access to the vacuum turntable, which is preferably vertically adjustable and comprises drive members which interact with it, and centring means for centring the cheese on the vacuum turntable, the components, apart from the vacuum turntable, i.e. the holding member, the guide, unwinding and cutting means, the blocking device, the wetting device and the strip-application device, are advantageously arranged on a support which can pivot about a vertical axis. It is thus possible for the cheese to be fed to the rotation means without obstacle, either by hand or by machine, and to be removed therefrom. The strip-application device may therefore likewise be positioned close to the circumference of the cheese to which a banderole is to be applied, preferably along a line of contact with the circumference of the cheese.

[0016] The pressure-exerting member advantageously comprises a pressure-exerting roller for pressing the banderole strip onto the cheese, which is arranged so that it can rotate about a vertical axis. Preferably,

the axis of rotation of the pressure-exerting member and the axis of rotation of the pivotable support for the other components lie on opposite sides of the device, so that both can be pivoted towards the rotation means without impeding one another.

[0017] To prevent the stock reel from continuing to rotate after the set length of banderole strip has been unwound, thus causing excessive banderole to be unwound, the holding member is preferably a push-on mandrel which is provided with a speed reduction means, such as a friction disc. It has been found that a weight on top of the stock reel exerts a frictional force on this reel which is such that, after the tensile force exerted by the unwinding means has been eliminated, the stock reel immediately stops rotating.

[0018] The invention also relates to a device for preparing cheeses which is provided with a banderole-application device according to the invention.

[0019] The banderole-application device according to the invention is explained below with reference to the appended drawing, in which the only figure shows a diagrammatic plan view of an embodiment of the banderole-application device according to the invention.

[0020] In this figure, reference numeral 1 denotes a banderole stock reel which is arranged on a push-on mandrel 2. The banderole material may be selected from the materials which are customarily used for this purpose, such as tissue paper and teabag paper or plastic, which are printed, for example, with information about the origin, type and quality of the cheese to which the banderole is to be applied. The banderole is guided off the stock reel 1 over guide means, including unwinding means. In this embodiment, the banderole is guided over a first freely rotatable roller 3 with a vertical axis of rotation, then over a displaceable flap-length adjustment roller 4, which can likewise rotate about a vertical axis, and a second freely rotatable roller 5 with vertical axis of rotation and, via a guide roll 6, to a strip-application device 7. The displaceable flap-length adjustment roller 4 is attached to the head of a piston 8 of a piston/cylinder assembly 9. As a result of the piston 8 being extended, a required flap length can be unwound from the banderole stock reel 1. To retain the free end of the banderole during this unwinding process, a blocking device 10 is provided, which is arranged between the guide roller 6 and the strip-application device 7. In the embodiment shown in this figure, the blocking device 10 comprises a piston/cylinder assembly 11 and a pressure-exerting plate 12 which is arranged opposite the head of the piston of this piston/cylinder assembly. The banderole is passed between this head and the pressure-exerting plate 12. To retain the banderole, the head is pressed against the banderole and against the pressure-exerting plate 12 as a result of the piston of this piston/cylinder assembly 11 being extended. The strip-application device 7 comprises a guide plate. To direct and control the flap projecting beyond the guide plate 7, if desired it is possible to use compressed air. A wetting

roller 13 which, during operation, is briefly brought into contact with the circumference of the cheese, in order to wet the latter, for example with a starch emulsion, which ensures that the banderole strip adheres to a cheese 14 and sticks the ends of an applied banderole strip to one another, is arranged in the vicinity of the guide plate 7. The wetting roller is attached to a support arm 30, so that the wetting roller 13 is pressed onto the cheese 14 with the aid of a spring. Furthermore, a cutting blade 15 is arranged in the vicinity of the end of the guide plate 7, which blade, with the aid of a piston/cylinder assembly 16, can be moved into the path of the banderole strip between the guide plate 7 and the cheese 14, in order to sever this strip. Advantageously, the abovementioned components of the device according to the invention are arranged on a support 17, which can pivot about a vertical pivot axis 18 and the pivoting movement of which is regulated by means of a piston/cylinder assembly 19 which acts on the corner of this support which lies opposite the pivot axis of the support 17. In this way, these components can be moved towards a vertically movable vacuum turntable 20, on which the cheese 14 to which a banderole is to be applied is centred with the aid of centring means 21 and is retained in a centred position by a vacuum member 22. The movable arrangement of the support 17 ensures that the vacuum turntable 20 is freely accessible for loading a cheese 14, either by hand or by machine, and removing a cheese which has been provided with a banderole strip, via roller conveyor 23. In order to bring the flap which has been removed from the guide plate 7 into contact with the cheese 14 and to press the flap onto the cheese, a pressure-exerting roller 24 is provided, which is attached to one end of a pivot arm 25 which can pivot about a vertical axis 29 and the pivoting movement of which is effected with the aid of a piston/cylinder assembly 26.

[0021] The device described above may be arranged at a fixed position in a production line for the preparation of cheeses, but may also be of mobile design, so that the banderole-application device according to the invention can be used at a plurality of locations in the cheese production process. Not only decorative banderoles but also supporting sleeves can be fitted to the cheeses formed using the device according to the invention.

[0022] The way in which the device described above operates is as follows. A banderole 27 is unwound from the stock reel 1 and is passed through the guide means of the device until it reaches the guide plate 7. The blocking device 10 is then activated, so that the head of the piston of the piston/cylinder assembly 11 presses against the banderole 27 and clamps it against the pressure-exerting plate 12. Then, the movable adjustment roller 4 is displaced from a reference position, in which this roller is situated almost between the first roller 3 and second roller 5, through a distance so that a flap length which corresponds to the distance between the guide plate 7 and the pressure-exerting roller 24 is unwound

from the banderole stock reel 1. The use of a piston/cylinder assembly 9, the stroke length of the piston 8 of which is adjustable, allows any desired flap length to be unwound from the banderole stock reel 1, so that the device according to the invention is suitable for applying a banderole strip to cheeses of different diameters. The device preferably uses pneumatically driven piston/cylinder assemblies. The cheese 14 to which a banderole is to be applied is placed onto the vacuum turntable 20 by hand or machine and is centred by means of the centring means 21. After the cheese 14 has been centred, the turning plate of the vacuum turntable 20 is raised. The centring means 21 then rotate away, so that the cheese 14 can rotate freely. Next, the support 17 is rotated about the vertical pivot axis 18 as a result of the piston of the piston/cylinder assembly 19 being extended, so that the guide plate 7 is moved close to the circumference of the cheese 14 to which a banderole is to be applied. Also, the piston of the piston/cylinder assembly 9 is moved back into its reference position, and the blocking of the banderole with the aid of the head of the piston/cylinder assembly 11 and the pressure-exerting plate 12 is stopped. The wetting roller 13 is briefly brought into contact with the circumference of the cheese. At the guide plate 7, the flap length which has been unwound and released is directed along the incoming pressure-exerting roller 24 (through actuation of the piston/cylinder assembly 26) with the aid of compressed air and is thus brought into contact with the circumference of the rotating cheese 14, which is being rotated by means of the vacuum turntable 20. In this way, the banderole strip is applied to the cheese 14, the banderole being unwound from the reel 1. After slightly more than one revolution of the cheese, once the blocking device 10 has engaged on the banderole, the cutting blade 15 is activated and cuts through the banderole strip. The pressure-exerting roller 24 returns to its starting position and the pivotable support 17 is likewise rotated back into its starting position. The movement of the turntable 20 is stopped, the turning plate thereof is lowered and the cheese is removed via the roller conveyor 23. To prevent more than the desired flap length or strip length being unwound during the extension of the piston 8 of the piston/cylinder assembly 9 and during the banderole application itself, the push-on mandrel 2 is provided with a speed reduction means, such as a friction disc 28. A disc of this type may, for example, comprise a weight which presses onto the stock reel 1.

[0023] It will be understood that if the circumference of the cheese is inherently sufficiently moist, for example in the case of a cheese which has just been coated with cheese plastic, the wetting means 13 are superfluous.

Claims

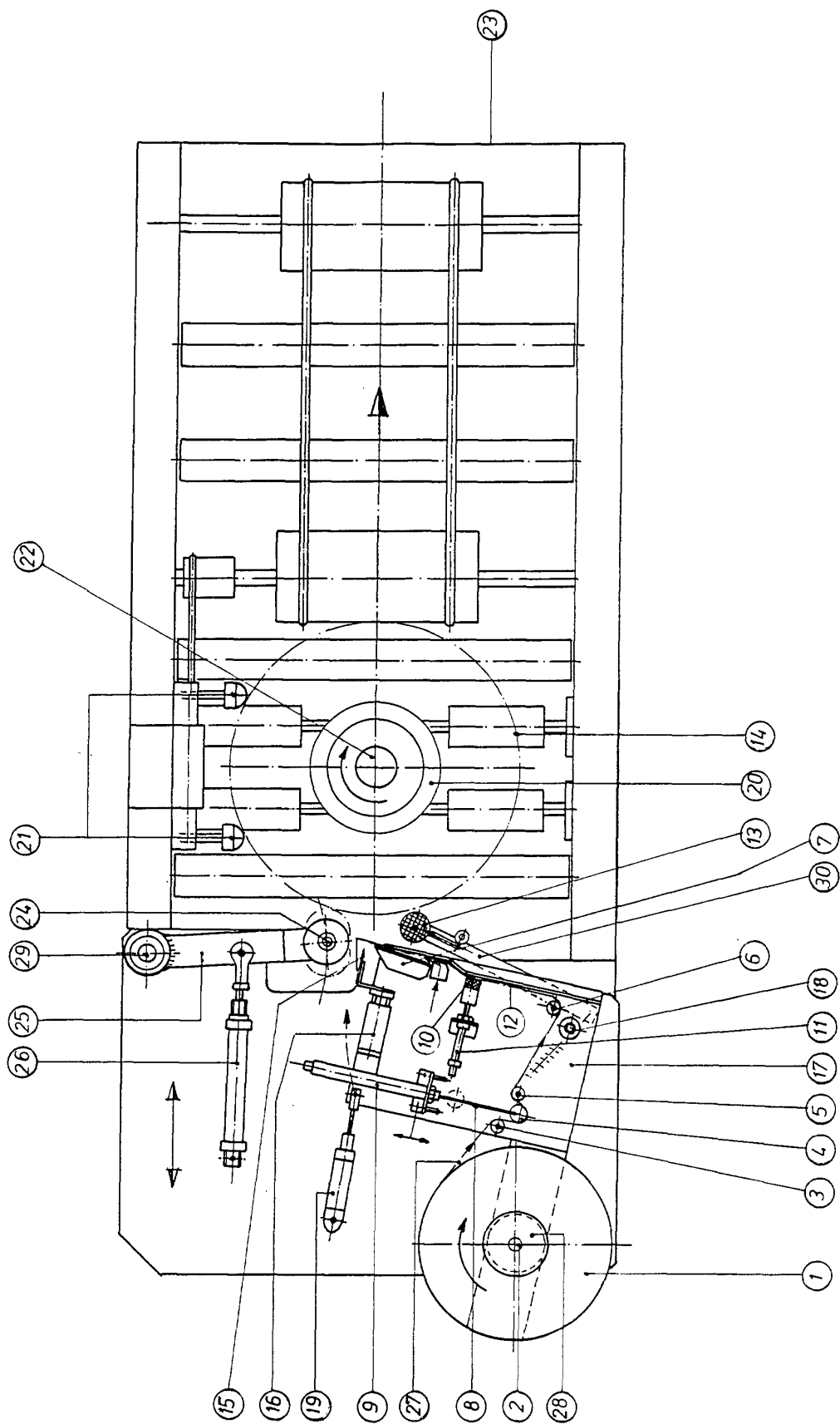
1. Device for applying a banderole (27) to the circumference of a rotating cheese (14), which device

comprises rotation means for rotating the cheese, a strip-application device (7) for applying a banderole strip to the circumference of the rotating cheese (14), a pressure-exerting member (24) for pressing the banderole strip which has been supplied by the strip-application device (7) onto the cheese, a holding member (2) for holding a banderole stock reel (1), guide means (6) for guiding the banderole off the banderole stock reel (1) towards the strip-application device (7) and cutting means (15) for cutting off the banderole strip between the strip-application device (7) and rotation means, **characterized in that** the rotation means comprise a vacuum turntable (20) with vacuum means for retaining and positioning the cheese.

2. Device according to claim 1, **characterized in that** the vacuum turntable (20) with vacuum means comprises an upper surface with a large number of perforations which are in communication with a vacuum source. 20
3. Device according to claim 1, **characterized in that** the vacuum turntable (20) with vacuum means comprises a turntable and a freely rotatable retaining member which is arranged above the turntable and has suction nozzles, which suction nozzles are in communication with a vacuum source. 25
4. Device according to one of the preceding claims, **characterized in that** there are unwinding means (3-5) for unwinding a flap length from the banderole stock reel, which flap length is greater than the distance between the strip-application device (7) and the pressure-exerting member (24). 30 35
5. Device according to claim 4, **characterized in that** the unwinding means comprise two rollers (3, 5), which are arranged at a fixed position and can rotate freely about a vertical axis, and a flap-length adjustment roller (4), which is arranged so that it can move substantially between the said rollers. 40
6. Device according to claim 5, **characterized in that** the movably arranged roller (4) is rotatably attached to the head of a piston (8) of a piston/cylinder assembly (9). 45
7. Device according to one of the preceding claims, **characterized in that** the unwinding means also comprise a blocking device (10) for blocking the movement of the banderole, which device is arranged in front of the strip-application device (7), as seen in the direction of movement of the banderole. 50 55
8. Device according to claim 7, **characterized in that** the blocking device (10) comprises a piston/cylinder assembly (11) and a pressure-exerting plate (12)

which is arranged at a distance from the head of the piston.

9. Device according to claim 8, **characterized in that** the head of the piston of the piston/cylinder assembly (11) is provided with a nonslip material for the banderole. 5
10. Device according to one of the preceding claims, **characterized in that** the strip-application device comprises a guide plate (7). 10
11. Device according to one of the preceding claims, **characterized in that** the device comprises a feed member (13) for wetting the circumference of the cheese (14). 15
12. Device according to one of the preceding claims, **characterized in that** the holding member (2), feed member (13), the guide means (6), cutting means (15), unwinding means (3-5), blocking device (10) and the strip-application device (7) are arranged on a support (17) which can pivot about a vertical axis (18). 20
13. Device according to one of the preceding claims, **characterized in that** the pressure-exerting member comprises a pressure-exerting roller (24), which is arranged so that it can rotate about a vertical pivot axis (29), for pressing the banderole strip onto the cheese (14). 25
14. Device according to one of the preceding claims, **characterized in that** the holding member is a push-on mandrel (2) which is provided with a speed reduction means (28). 30
15. Device for preparing cheeses which is provided with a banderole-application device according to one of claims 1-14. 35 40 45 50 55





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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 1330

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 683 100 A (MACHINEFABRIEK LEDOUX B.V.) 22 November 1995 (1995-11-22) * column 4, line 34 - line 48; figure 1 *	1,15	B65C3/16 B65C9/04 B65C9/18
D,A	NL 1 010 759 C (MACHINEFABRIEK LEDOUX B.V.) 28 October 1999 (1999-10-28) * page 7, line 3 - line 9; figure 1 *	1,15	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21 June 2001	Examiner Deutsch, J.-P.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/92 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 1330

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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21-06-2001

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