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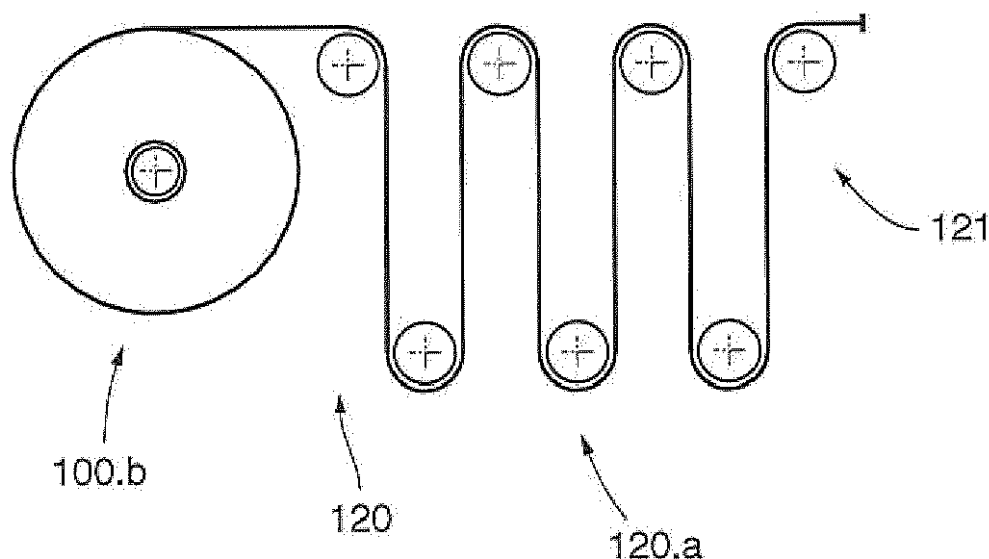
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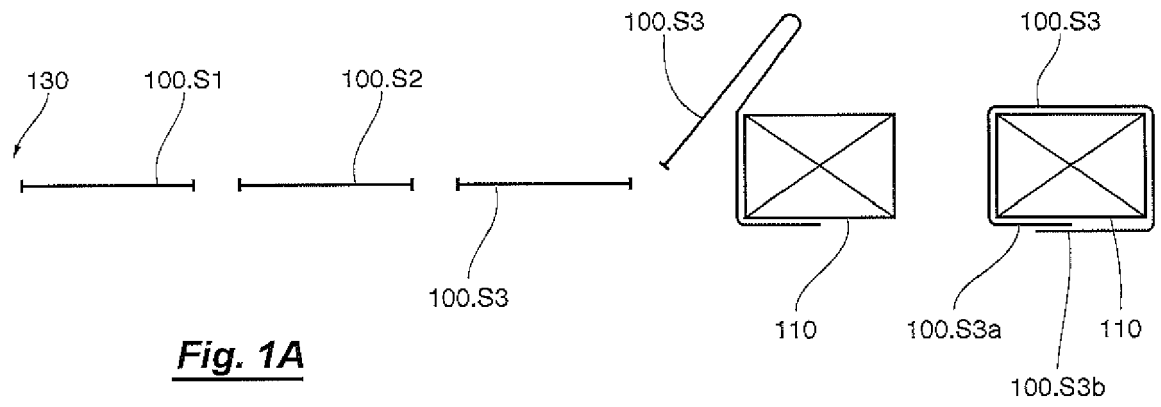
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(54) **METHOD FOR WRAPPING OBJECTS**

(57) _A method for wrapping an object (110) by means of a hot sheet of heat-shrink material comprises the following operations: **a)**_heating a downstream portion (121) of a continuous tape (120) of heat-shrinkable material at a first temperature; **b)**_cutting (130) said heated downstream portion (121) of continuous tape in order to obtain a hot sheet (100.S1); **c.1)**_heating said last hot sheet (100.S1) of heat-shrinkable material to a second temperature which is slightly lower than the softening and/or shrinking temperature of the heat-shrinkable material; **c.2)**_heating said last sheet (100.S2) of heat-shrink material to a third temperature which is equal to or greater than the softening and/or shrinking temperature of the heat-shrinkable material; **d)**_winding said last hot sheet (100.S3) of heat-shrinkable material having said temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinkable material around the article (110) to be wrapped.

Fig. 1





Description

Field of Invention

[0001] _The present invention relates to a method for wrapping objects by means of hot sheets of heat-shrinkable material.

Background of the Invention

[0002] _At present time, see patent EP_1.013.551, methods for wrapping objects by sheets of heat shrinkable material are known wherein, summarily, by said methods, each individual object is wrapped one after the other by means of a respective sheet of heat-shrinkable material, wherein said sheet has been previously heated to a temperature higher than the softening temperature of the heat-shrinkable material.

[0003] _These methods have a number of drawbacks.

[0004] _A first drawback is due to the fact that said methods do not allow to operate at high operating speeds and, therefore, they do not allow to obtain a high wrapping productivity.

[0005] _A second drawback is due to the fact that they do not allow to get an uniform and/or rapid heating of the sheet.

[0006] _A third drawback is due to the fact such methods do not allow to get a good synchronization between the various operations to be performed and a good execution of the same operations.

[0007] _A fourth drawback is due to the fact that they do not allow to get a quick format change to be carried out in relation to the size of the sheet of material and/or in relation to the size of the items to be packaged and/or in relation to the type of shrinkable material of which the sheet is composed.

[0008] _A fifth drawback is due to the fact that these methods do not allow to get an easy execution of the cutting of the sheets.

[0009] _A sixth disadvantage is due to the fact that they do not allow to perform operations in relation to the temperature of the sheets during the wrapping phase.

Exposure of the Invention

[0010] _The purpose of the present invention is therefore to solve the aforementioned drawbacks.

[0011] _The invention, which is characterized by the claims, solves the problem of creating a method for wrapping an object by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve around the object to be wrapped, in which said hot sheet is obtained by a continuous tape of heat-shrinking material, in which said method is characterized by the fact that it comprises the following steps: **a)** heating a downstream portion of the continuous tape of heat-shrinking material to a first temperature, in which said first temperature is lower and/or little lower than a

temperature which would not allow the cutting of said tape; **b)** cutting said heated and hot downstream portion of the continuous tape, in order to obtain a hot sheet of heat-shrinking material having a desired longitudinal length; **c.1)** heating said last hot sheet of heat-shrinking material to a second temperature, in which said second temperature is little lower than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet having a temperature little lower than the softening and/or shrinking temperature of the shrinking material; **c.2)** heating said last hot sheet of heat-shrinking material to a third temperature, in which said third temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet having a temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinking material; **d)** wrapping said last hot sheet of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object to be packaged, in which said wrapping comprises a front portion and a rear portion of said last heated and hot sheet overlapping one another.

[0012] _The invention, which is characterized by the claims, solves the problem of creating a method for packaging an object by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve around the object to be wrapped, in which said hot sheet is obtained by a continuous tape of heat-shrinking material, in which said method is characterized by the fact that it comprises the following steps: **a)** heating a downstream portion of the continuous tape of heat-shrinking material to a first temperature, in which said first temperature is lower and/or little lower than a temperature which would not allow to cut said tape; **b)** cutting said heated and hot downstream portion of the continuous tape, in order to obtain a heated and hot sheet of heat-shrinking material having a desired longitudinal length; **c)** heating said last heated and hot sheet of heat-shrinking material to a second temperature, in which said second temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a heated and hot sheet having a temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinking material; **d)** wrapping said last heated and hot sheet of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object to be wrapped, in which said wrapping comprises a front portion and a rear portion of said last heated and hot sheet overlapping one another.

Brief description of the Drawings

[0013] _Further features and advantages of the present invention will be more evident from the following description of two preferred practical embodiments, pro-

vided here purely by way of example and without restrictive intent, made with reference to the accompanying drawings, in which:

- >_Figure 1 and 1A illustrate schematically a first embodiment of the method object of the present invention;
- >_Figure 2 and 2A illustrate schematically a second embodiment of the method object of the present invention.

FIRST form of Embodiment

[0014] _With reference to Figure 1, according to a first embodiment, the method object of the present invention is designed to wrap at least one object **110** by a hot sheet **100.S3** of heat-shrinkable material, wherein said hot sheet **100.S3** is obtained by means of a continuous tape **120** of heat-shrinkable material, wherein said tape **120** is unwound from a reel **100.B**.

[0015] _This method, summarily, in a non-limiting way, includes a series of operations as hereinafter described.

[0016] _The heating of a downstream portion of a continuous tape **120** of heat-shrinkable material to a first temperature, wherein said first temperature is lower and preferably slightly lower than the temperature which does not allow to cut easily said tape, therefore substantially a first temperature higher than the ambient temperature and, preferably, a first temperature comprised between 40°C and 70°C, wherein said first temperature will be selected with reference to the type of wrapping material and also with reference to the thickness of the same tape material.

[0017] _The cutting **130** of said downstream portion **121** of heated continuous tape in order to obtain a sheet **100.S1** of heated and hot material having a desired longitudinal length.

[0018] _The heating of said sheet **100.S1** of heated and hot material to a second temperature which is preferably slightly lower than the softening and/or shrinking temperature of the heat-shrinkable material, in order to obtain a sheet **100.S2** having a temperature slightly lower than the softening and/or shrinking temperature of the heat-shrinkable material.

[0019] _The heating of the sheet **100.S2** of heated and hot material to a third temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinkable material in order to obtain a sheet **100.S3** having a temperature equal or greater than the temperature of softening and/or shrinking of the heat-shrink material,

[0020] _The wrapping of the last sheet **100.S3** of hot material having a temperature equal or greater than the softening and/or shrinking temperature around the object **110** to be packaged.

[0021] _After the wrapping of the article **110** with the sleeve-wrapped sheet **100.S3**, with a front end portion **100.S3a** of the portion **100.S3** positioned under the article **110**, with a rear end portion **100.S3b** of the same sheet **100.S3** positioned under said front end portion

100.S3a, if desirable, heating can be executed in the vicinity of said overlap, **100.S3a_100.S3b**, in order to obtain a weld between said two end portions **100.S3a_100.S3b**.

5 [0022] _Finally, said sheet **100.S3** is allowed to cool in order to obtain heat shrinking with relative formation of the package.

[0023] _With reference to Figure 1A, again according to said first embodiment, the method object of the present invention comprises: _a first station **100.ST1** for heating the tape and for feeding the heated tape; _a second station **100.ST2** for receiving of the hot tapet, for cutting the hot tape and for feeding the hot sheets; _a third station **100.ST3** for receiving hot sheets, for heating these hot sheets and for supplying the hot sheets; _a fourth station **100.ST4** for receiving hot sheets, for heating these hot sheets for and for feeding hot sheets; and _a fifth station **100.ST5** for receiving hot sheets and for wrapping hot sheets.

20 [0024] _With reference to said stations, **100.ST1**, **100.ST2**, **100.ST3**, **100.ST4** and **100.ST5**, the following operating steps are performed: **a)**_positioning a downstream portion of the continuous tape of heat-shrinking material into said first station; **b)**_heating in said first station said downstream portion of said continuous tape of heat-shrinking material to a first temperature, in which said first temperature is little lower than the temperature which would not allow to cut said tape; **c)**_transferring said hot downstream portion of said continuous tape from said first station in said second station; **d)**_cutting into said second station said hot downstream heated portion of the continuous tape, in order to obtain a hot sheet of heat-shrinking material having a desired longitudinal length; **e)**_transferring said last hot sheet from said second station in said third station; **f)**_heating in said third station said last hot sheet of heat-shrinking material to a second temperature, in which said second temperature is little lower than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet having a temperture little lower than the softening and/or shrinking temperature of the shrinking material; **g)**_transferring said last hot sheet from said third station in said fourth station; **h)**_heating in said fourth station said last hot sheet of heat-shrinking material to a third temperature, in which said third temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet having a temperture equal or greater than the softening and/or the shrinking temperature of the heat-shrinking material; **i)**_transferring said last hot sheet from said fourth station in said fifth station; **l)**_wrapping in said fifth station the said last hot sheet of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object to be packaged, in which said wrapping comprises a front portion and a rear portion of said last heated and hot sheet overlapping one another.

[0025] _With reference to said third temperature, if desirable, it can be equal to or greater than the welding temperature of the heat-shrinkable material and, in this case, said last sheet 100.S3 of hot material having said temperature equal to or greater than the welding temperature of the heat-shrink material is wrapped around the object 110 to be packaged.

[0026] _Still with reference to said third temperature, if desirable, it can be a temperature such as to obtain the welding between the front portion 100.S3a and the rear portion 100.S3b of the same sheet 100.S3 when said two portions 100.S3a and 100.S3b are arranged in mutual overlap.

[0027] _With reference to the wrapping steps and to the transporting steps of the sheet 100.S3 around the object 110, if desired, it is also possible to heat said sheet 100.S3 during the execution of said steps.

[0028] _With reference to the step in which a downstream portion 121 of continuous tape 120 of heat-shrink material is heated, again preferably, a downstream portion 120.a of heat-shrinking material is moved along a heating path having a snake like shape, in order to reduce the overall dimensions and dissipate less heat.

SECOND form of Embodiment

[0029] _With reference to Figure 2, according to a second embodiment, the method object of the present invention is designed to wrap at least one object 10 by a hot sheet S2 of heat-shrinkable material, in which said hot sheet S2 is obtained by a continuous tape 20 of shrink-wrap material, wherein said tape 20 is unwound from a roll B.

[0030] _This method, summarily, in a non-limiting way, includes a series of steps as hereinafter described.

[0031] _The heating of a downstream portion 21 of a continuous tape 20 of heat-shrinkable material to a first temperature, wherein said first temperature is lower and preferably slightly lower than the temperature which does not allow to cut easily said tape, therefore, substantially, a first temperature higher than the room temperature and, preferably, a first temperature comprised between 40°C and 70°C, wherein said first temperature will be selected with reference to the type of wrapping material and also with reference to the thickness of the same tape material.

[0032] _The cutting 130, for example in the point 30, of said heated downstream portion 21 of heated continuous tape, in order to obtain a sheet S1 of material, in which said sheet S1 is a heated and hot sheet having a desired longitudinal length.

[0033] _The heating of said sheet S1 of heated and hot material having a temperature slightly lower than the temperature which does not allow to cut the tape to a second temperature which is equal to or greater than the softening and/or shrinking temperature of the heat-shrinkable material, in order to obtain a sheet S2 having a temperature equal or greater than the softening and/or shrinking temperature.

[0034] _Wrapping said last heated and hot sheet S2 of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object 10 to be wrapped, in which said wrapping comprises a front portion S2a and a rear portion S2b of said last heated and hot sheet S2 overlapping one another.

[0035] _After the wrapping of the article 10 with the sheet S2 wound as a sleeve, with a front end portion S2a of the sheet S2 positioned under the article 10 and with a rear end portion S2b of the same sheet S2 positioned under said front end portion S2a, heating can be executed in the vicinity of said overlap, S2a_S2b, in order to obtain a weld between said two end portions S2a_S2b.

[0036] _Finally, said sheet S2 is allowed to cool in order to obtain the heat shrinking with relative formation of the package.

[0037] _With reference to Figure 2A, again according to said second embodiment, the method object of the present invention comprises: _a first station ST1 for heating tape and for feeding hot tape; _a second station ST2 for receiving hot tape, for cutting hot tape and for feeding hot sheets; _a third station ST3 for receiving hot sheets, for heating hot sheets and for feeding hot sheets; _a fourth station ST4 for receiving hot sheets and for wrapping hot sheets.

[0038] _With reference to said stations ST1, ST2, ST3 and ST4, the following steps are executed: a)_positioning a downstream portion 21 of the tape 20 of heat-shrinking material into said first station ST1; b)_heating in said first station ST1 said downstream portion 21 of said continuous tape 20 of heat-shrinking material to a first temperature, in which said first temperature is lower and preferably little lower than a temperature which would not allow to cut said tape; c)_transferring said hot downstream portion 21 of said continuous tape 20 from said first station ST1 in said second station ST2; d)_cutting 30 into said second station ST2 said heated and hot downstream portion 21 of the continuous tape, in order to obtain a hot sheet S1 of heat-shrinking material having a desired longitudinal length; e)_transferring said last hot sheet S1 from said second station ST2 in said third station ST3; f)_heating in said third station ST3 said last hot sheet S1 of heat-shrinking material to a second temperature, in which said second temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet S2 having a temperature equal or greater with respect to the softening and/or shrinking temperature of the heat-shrinking material; g)_transferring said last hot sheet S2 from said third station ST3 in said fourth station ST4; h)_wrapping in said fourth station ST4 said last hot sheet S2 of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object 10 to be packaged, in which said wrapping comprises a front portion S2a and a rear portion S2b of said last heated and hot sheet S2 overlapping one another.

[0039] _With reference to said second temperature, if desirable, it may also be equal to or greater than the welding temperature of the heat-shrinkable material and, in this case, said last sheet S2 of hot material having said temperature equal to or greater than the temperature of welding of the heat-shrinkable material is wrapped around the object 10 to be packaged.

[0040] Still with reference to said second temperature, if desirable, it can be a temperature such as to obtain the welding between the front portion S2a and the rear portion S2b of the same sheet S2 when said two portions S2a and S2b are arranged in mutual overlap.

[0041] _With reference to the wrapping steps and to the transporting steps of the sheet S2 around the object 10, if desired, it is also possible to heat said sheet S2 during the execution of said steps.

[0042] _With reference to the steps in which a downstream portion 21 of continuous tape 20 of heat-shrink material is heated, preferably said downstream portion 20.a of heat-shrink material is moved along a heating path having a snake like shape, in order to reduce the overall dimensions and dissipate less heat.

[0043] _With reference to the above description by the methods object of the present invention, with respect to the prior art, the following results are obtained.

[0044] _The tape cutting steps are improved to obtain the sheet, as the cutting takes place with a tape having a temperature slightly lower than the softening and/or shrinking temperature, and therefore a temperature in which said tape is still rigid and it is not sticky/soggy.

[0045] _The heating process is improved to obtain the hot sheet, as said heating takes place by means of two or more distinct and separate steps of heating (as first step the downstream portion of the tape is heated then the cutted sheet is further heated by one or more steps), allowing to modulate the heating by means of a plurality of separate individual heating steps until the desired temperature is reached.

[0046] _The heating time of the sheet is improved and reduced, as the sheet obtained after cutting is not at room temperature but at a higher temperature, preferably at a temperature slightly lower than the softening and/or shrinking temperature.

[0047] _The lengths of the path or of the paths for sheet heating are improved and reduced, as the sheet obtained after cutting is not at the room temperature but at a higher temperature.

[0048] _The wrapping steps are improved, as during said steps the sheet can be heated, for example in order to maintain and/or increase the temperature for the same sheet.

[0049] _The characteristics relating to the change of format in relation to the size of the sheet and/or in relation to the dimensions of the objects to be wrapped are improved, as it is possible to operate on a plurality of operating steps (and not on a single phase) in order to obtain the heated sheet to the desired temperature.

[0050] _The characteristics relating to the change in

setting in relation to the type and/or thickness of the wrapping film material are improved, as it is possible to operate on a plurality of operating steps (and not on a single operating phase) to obtain the sheet heated at the desired temperature.

[0051] _The description of the above-mentioned methods is given purely by way of non-limiting example and, therefore, it is evident that all the modifications or variations suggested by practice and/or their use, and in any case within the scope of the following claims. _In this context, the following claims also form an integrative part for the above-described description.

Claims

1. Method for wrapping an object (110) by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve around the object (110) to be wrapped, in which said hot sheet is obtained by a continuous tape (120) of heat-shrinking material, **characterized by the fact that** said method comprises the following steps:
 - a)_heating a downstream portion (121) of the continuous tape (120) of heat-shrinking material to a first temperature, in which said first temperature is lower and/or little lower than a temperature which would not allow the cutting of said tape; b)_cutting (130) said heated and hot downstream portion (121) of the continuous tape, in order to obtain a hot sheet (100.S1) of heat-shrinking material having a desired longitudinal length; c.1)_heating said last hot sheet (100.S1) of heat-shrinking material to a second temperature, in which said second temperature is little lower than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet (100.S2) having a temperature little lower than the softening and/or shrinking temperature of the shrinking material; c.2)_heating said last hot sheet (100.S2) of heat-shrinking material to a third temperature, in which said third temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet (100.S3) having a temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinking material; d)_wrapping said last hot sheet (100.S3) of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object (110) to be packaged, in which said wrapping comprises a front portion (100.S3a) and a rear portion (100.S3b) of said last heated and hot sheet (100.S3) overlapping one another.
2. Method for wrapping an object (110) by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve

around the object (110) to be wrapped, in which said hot sheet is obtained by a continuous tape (120) of heat-shrinking material, **characterized by the fact that** said method comprises: **a**_a first station (100.ST1) for heating tape and for feeding heated tape; **a**_a second station (100.ST2) for receiving hot tape, for cutting hot tape and for feeding hot sheets; **a**_a third station (100.ST3) for receiving hot sheets, for heating hot sheets and for feeding hot sheets; **a**_a fourth station (100.ST4) for receiving hot sheets, for heating hot sheets and for feeding hot sheets; **a**_a fifth station (100.ST5) for receiving hot sheets and for wrapping hot sheets; **and characterized by the fact that** said method comprises the following steps: **a**)_positioning a downstream portion (121) of the continuous tape (120) of heat-shrinking material into said first station (100.ST1); **b**)_heating in said first station (100.ST1) said downstream portion (121) of said continuous tape (120) of heat-shrinking material to a first temperature, in which said first temperature is little lower than a temperature which would not allow to cutting said tape; **c**)_transferring said hot downstream portion (121) of said continuous tape (120) from said first station (100.ST1) in said second station (100.ST2); **d**)_cutting (130) into said second station (100.ST2) said heated and hot downstream portion (121) of the continuous tape, in order to obtain a hot sheet (100.S1) of heat-shrinking material having a desired longitudinal length; **e**)_transferring said last hot sheet (100.S1) from said second station (100.ST2) in said third station (100.ST3); **f**)_heating in said third station (100.ST3) said last hot sheet (100.S1) of heat-shrinking material to a second temperature, in which said second second temperature is little lower than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet (100.S2) having a temperature little lower than the softening and/or shrinking temperature of the shrinking material; **g**)_transferring said last hot sheet (100.S2) from said third station (100.ST3) in said fourth station (100.ST4); **h**)_heating in said fourth station (100.ST4) said last hot sheet (100.S2) of heat-shrinking material to a third temperature, in which said third temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet (100.S3) having a temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinking material; **i**)_transferring said last hot sheet (100.S3) from said fourth station (100.ST4) in said fifth station (100.ST5); **l**)_wrapping in said fifth station (100.ST5) said last hot sheet (100.S3) of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object (110) to be packaged, in which said wrapping comprises a front portion (100.S3a) and a rear portion (100.S3b) of

said last heated and hot sheet (100.S3) overlapping one another.

3. Method according to claim 1 or 2, **characterized by the fact that** said third temperature is equal or greater than the welding temperature of heat-shrink material.
4. Method according to claim 1 or 2, **characterized by the fact that** said third temperature is a temperature such as to obtain the welding between the front portion (100.S3a) and the rear portion (100.S3b) of said last heated and hot sheet (100.S3) when these portions (100.S3a, 100.S3.b) are overlapping one another.
5. Method for packaging an object (10) by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve around the object (10) to be wrapped, in which said hot sheet is obtained by a continuous tape (20) of heat-shrinking material, **characterized by the fact that** it comprises the following steps: **a**)_heating a downstream portion (21) of the continuous tape (20) of heat-shrinking material to a first temperature, in which said first temperature is lower and/or little lower than a temperature which would not allow to cut said tape; **b**)_cutting (30) said heated and hot downstream portion (21) of the continuous tape, in order to obtain a heated and hot sheet (S1) of heat-shrinking material having a desired longitudinal length; **c**)_heating said last heated and hot sheet (S1) of heat-shrinking material to a second temperature, in which said second temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a heated and hot sheet (S2) having a temperature equal or greater than the softening and/or shrinking temperature of the heat-shrinking material; **d**)_wrapping said last heated and hot sheet (S2) of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object (10) to be wrapped, in which said wrapping comprises a front portion (S2a) and a rear portion (S2b) of said last heated and hot sheet (S2) overlapping one another.
6. Method for wrapping an object (10) by means of a hot sheet of heat-shrinking material, in which said hot sheet is wrapped in the manner of a sleeve around the object (10) to be wrapped, in which said hot sheet is obtained by a continuous tape (20) of heat-shrinking material, **characterized by the fact that** said method comprises: **a**_a first station (ST1) for heating tape and for feeding hot tape; **a**_a second station (ST2) for receiving hot tape, for cutting hot tape and for feeding hot sheets; **a**_a third station (ST3)

for receiving hot sheets, for heating hot sheets and for feeding hot sheets; **a**) a fourth station (ST4) for receiving hot sheets and for wrapping hot sheets; **and characterized by the fact that** it comprises the following steps: **a**) positioning a downstream portion (21) of the continuous tape (20) of heat-shrinking material into said first station (ST1); **b**) heating in said first station (ST1) said downstream portion (21) of said continuous tape (20) of heat-shrinking material to a first temperature, in which said first temperature is little lower than a temperature which would not allow to cut said tape; **c**) transferring said hot downstream portion (21) of said continuous tape (20) from said first station (ST1) in said second station (ST2); **d**) cutting (30) into said second station (ST2) said heated and hot downstream portion (21) of the continuous tape, in order to obtain a hot sheet (S1) of heat-shrinking material having a desired longitudinal length; **e**) transferring said last hot sheet (S1) from said second station (ST2) in said third station (ST3); **f**) heating in said third station (ST3) said last hot sheet (S1) of heat-shrinking material to a second temperature, in which said second temperature is equal or greater than the softening and/or shrinking temperature of the heat-shrinking material, in order to obtain a hot sheet (S2) having a temperature equal or greater with respect to the softening and/or shrinking temperature of the heat-shrinking material; **g**) transferring said last hot sheet (S2) from said third station (ST3) in said fourth station (ST4); **h**) wrapping in said fourth station (ST4) said last hot sheet (S2) of heat-shrinking material having a temperature equal to or greater than the softening and/or shrinking temperature of the heat-shrinking material around the object (10) to be packaged, in which said wrapping comprises a front portion (S2a) and a rear portion (S2b) of said last heated and hot sheet (S2) overlapping one another.

7. Method according to claim 5 or 6, **characterized by the fact that** said second temperature is equal or greater than the welding temperature of heat-shrink material. 40
8. Method according to claim 5 or 6, **characterized by the fact that** said second temperature is a temperature such as to obtain the welding between the front portion (S2a) and the rear portion (S2b) of said last heated and hot sheet (S2) when these portions (S2a, S2b) are overlapping one another. 45 50
9. Method according to one of the preceding claims, **characterized by the fact that** during the heating of the front portion (121/21) of the continuous tape (120/20) of heat-shrinking material said downstream portion (121/21) of heat-shrinking material moves along a path having a snake like shape. 55

10. Method according to one of the preceding claims, **characterized by the fact that** said first temperature is greater than the room temperature.

- 5 11. Method according to one of the preceding citations, **characterized by the fact that** said first temperature is between a minimum of 40°C and a maximum of 70°C.

- 10 12. Method according to one of the preceding claims, **characterized by the fact that** while wrapping the hot sheet (100.S3/S2) around the object (110/10) said hot sheet (100.S3/S2) of heat-shrinking material is heated.

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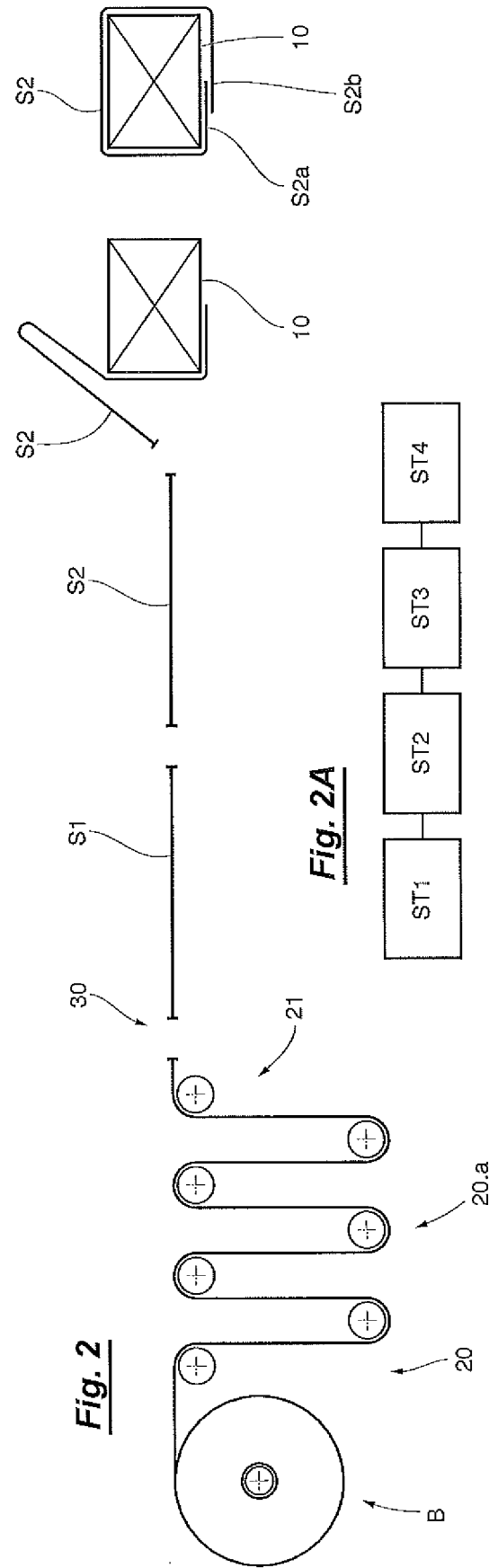
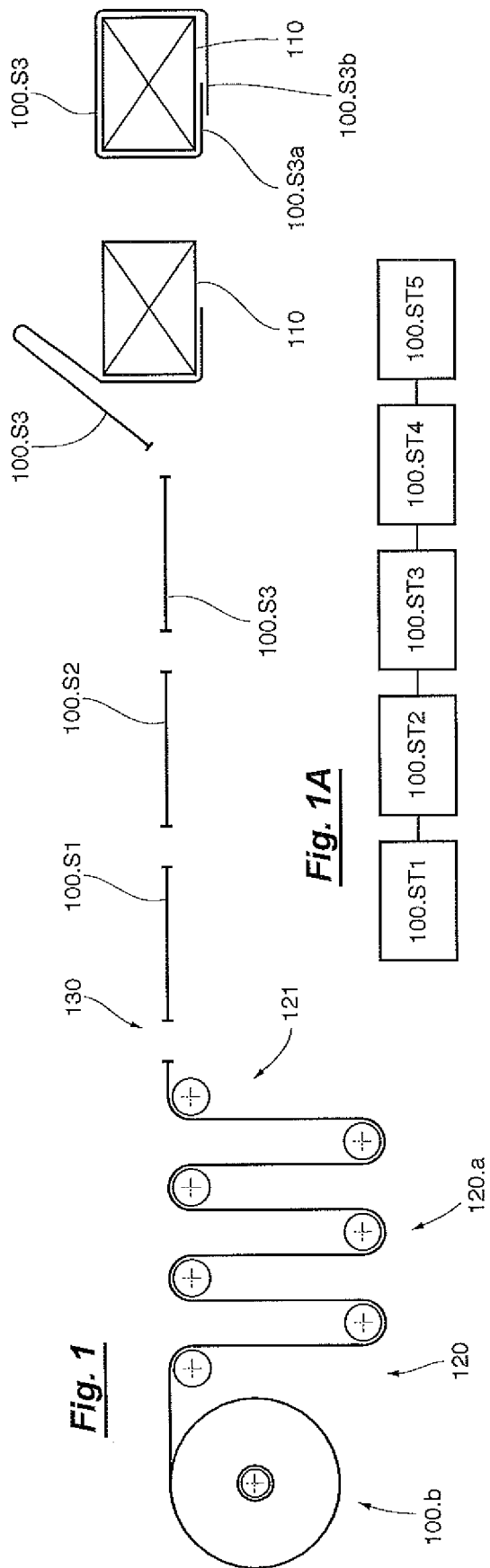
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EUROPEAN SEARCH REPORT

Application Number
EP 17 20 5095

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 1 013 551 A2 (BAUMER SRL [IT]) 28 June 2000 (2000-06-28)	5-12	INV. B65B53/02 B65B11/10
A	* paragraph [0054] - paragraph [0079] * * paragraph [0049] *	1-4	
Y	EP 2 495 178 A1 (KRONES AG [DE]) 5 September 2012 (2012-09-05) * paragraph [0025] - paragraph [0026] *	5-12	
A	EP 2 354 014 A1 (TETRA LAVAL HOLDINGS & FINANCE [CH]) 10 August 2011 (2011-08-10) * paragraph [0039] - paragraph [0043] *	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 February 2018	Examiner Yazici, Baris
CATEGORY OF CITED DOCUMENTS 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 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			

 2
EPO FORM 1503 03.02 (P04C01)

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

EP 17 20 5095

5

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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14-02-2018

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1013551 A2	28-06-2000	EP 1013551 A2	28-06-2000
		IT B0980706 A1	22-06-2000
		US 6474041 B1	05-11-2002
		US 2002189204 A1	19-12-2002
EP 2495178 A1	05-09-2012	CN 102653321 A	05-09-2012
		DE 102011013117 A1	06-09-2012
		EP 2495178 A1	05-09-2012
EP 2354014 A1	10-08-2011	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1013551 A [0002]