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(54) **APPARATUS AND METHOD TO APPLY AN ADHESIVE ON ARTICLES**

(57) Apparatus to apply an adhesive (14) on articles (12), it comprises a support and movement member (20), configured to support the articles (12) and make them move forward in a direction of movement (M), a delivery device (24) to deliver a substrate (26) in the form of a

strip, which is provided on one surface with said adhesive (14) and an applicator device (28) configured to apply part of the adhesive (14) present on the substrate (26) onto the articles (12).

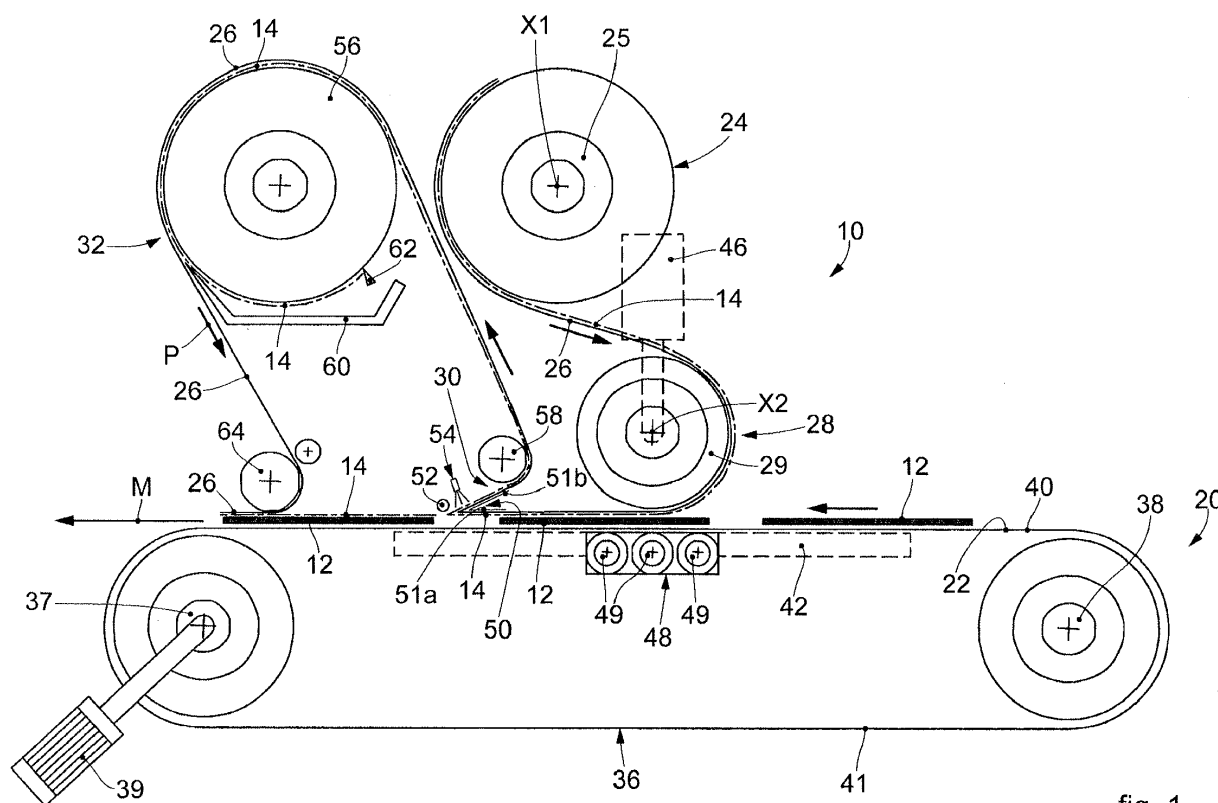


fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns an apparatus to apply an adhesive to an article, such as for example an article made of plastic, metal, cork, wood, laminates, rubbers, fabrics, or leather, for example used in the fields of coatings, leather goods and footwear, so as to obtain an article having at least one adhesive surface, ready to be glued to other objects or supports.

[0002] The present invention also concerns a related method to apply the adhesive to the article.

BACKGROUND OF THE INVENTION

[0003] In the industrial sectors relating to coatings, leather goods, or footwear it is known to make articles provided with an adhesive layer on one surface which makes them suitable to be glued to other objects or supports.

[0004] Articles of the type in question can be, for example, tiles, insoles, or suchlike, on which a layer of adhesive material is applied to make them self-adhesive and ready for subsequent applications.

[0005] It is known to dispose the layer of adhesive material on one surface of the article by spraying, spreading or application with the aid of tools such as brushes, rollers, spray pistons, dosers, spatulas or suchlike. In these cases the adhesive is generally used in liquid form, that is, dispersed in a liquid carrier.

[0006] The liquid carrier can be a solvent based on alcohol, ether, ketone or hydrocarbons, and conveys the resin which is spread on the article. Subsequently the liquid carrier tends to evaporate and dry, and can be dispersed in the environment, or absorbed by the article itself.

[0007] One disadvantage of known solutions is that, during drying and evaporation, the liquid solvents can disperse substances that are harmful to the operators and the environment, and therefore suitable purification and absorption systems are necessary to aspirate the volatile substances, such systems require expensive installations and maintenance.

[0008] Another disadvantage of these solutions is that the liquid carrier can cause discolorations, stains and defects on the surfaces of the article on which it is applied, if absorbed by the latter.

[0009] Moreover, during drying through absorption, the adhesive material can also release volatile substances for a long period, which can be harmful and unhealthy and, for example in the case of leather goods or footwear, can also cause allergic reactions in users.

[0010] To try to overcome these disadvantages, in recent years the manufacturers of machines and plants to apply adhesives on an article have developed alternative solutions.

[0011] These solutions provide to apply the adhesive

to the article by means of a transfer technique which provides to use a substrate, generally in the form of a strip, provided on its surface with an adhesive layer.

[0012] The substrate is positioned with the surface provided with the adhesive layer in contact with the article and, by means of presser devices, is calendared on it, and then subsequently removed by eliminating both the substrate and also the residual adhesive from the part not affected by lamination.

[0013] Subsequently, a film is generally applied on the surface of the adhesive associated with the article, which protects the adhesive from the environment, so as to preserve its adhesive properties and characteristics.

[0014] One disadvantage of this known technique is that it is expensive as it involves both a waste of adhesive material and also a waste of the substrate with which the adhesive is associated.

[0015] Depending on the shape and size of the substrate to be coated, in fact, a bigger or smaller portion of adhesive remains adherent to the substrate, preventing any recycling thereof and also requiring suitable treatments or processes so that it can be disposed of in an appropriate manner.

[0016] One purpose of the present invention is to provide an apparatus to apply adhesive which at least partly overcomes the disadvantages of the apparatuses of the state of the art.

[0017] Another purpose of the present invention is to provide an apparatus to apply adhesive which allows to re-use, simply and effectively, the substrate that feeds the adhesive material, thus reducing waste.

[0018] Another purpose of the present invention is to provide an apparatus to apply adhesive which allows to recover the residual adhesive material so as to limit waste.

[0019] Another purpose of the present invention is to provide an apparatus to apply adhesive that is efficient and automatic.

[0020] Another purpose is to perfect a method to apply adhesive to an article which allows high productivity and recovery of the adhesive material and of the substrate with which it is associated.

[0021] Another purpose is to perfect a method to apply adhesive which has a reduced environmental impact and guarantees safety for the operators.

[0022] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0023] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0024] In accordance with the above purpose, an apparatus to apply an adhesive according to the present

invention can be used to apply a layer of adhesive on the surface of an article, so as to render it self-adhesive and ready for a subsequent application.

[0025] The articles discussed here can be made of any material, for example plastic, metal, cork, laminates, rubber, fabric or leather, or other.

[0026] Non-restrictive examples of articles can be, for example, metal washers, Plexiglas friezes, plastic objects, supports (shoe trees?) for shoes, cleaning insoles, flat reinforcements for leather goods, labels for clothing and in general any object with different shapes.

[0027] In accordance with one aspect of the present invention, the apparatus comprises:

- a support and movement member configured to support the articles and make them move forward in a direction of movement;
- a delivery device to deliver a substrate in the form of a strip and provided on one surface with the adhesive;
- an applicator device configured to apply part of the adhesive present on the substrate onto the articles;
- a separation device to separate the substrate together with the residual adhesive, from the articles, and
- a recovery device to recover the residual adhesive present on the substrate, positioned downstream of the separation device.

[0028] The apparatus according to the invention therefore allows to easily recover the unused adhesive material left on the substrate, so that it can be re-used in subsequent applications, for example applied to a new substrate strip, and at the same time therefore allows to re-use the substrate itself, reducing the overall waste of material.

[0029] In accordance with some embodiments, the apparatus comprises a coating device located downstream of the recovery device and configured to coat the articles with the substrate from which the residual adhesive has been removed.

[0030] This advantageously allows to re-use the same substrate used for applying the adhesive also as a substrate for protecting the adhesive article, without having to provide additional protective films.

[0031] According to some embodiments, the support and movement member of the articles comprises a closed-ring conveyor belt wound on at least two rollers. The conveyor belt is provided with an anti-adhesive surface defining a support surface for the articles.

[0032] According to other embodiments, the applicator device comprises presser means configured to exert a pressure in a direction orthogonal to the direction of movement so as to press the substrate and thus the adhesive on the article. This allows to transfer the adhesive to the article only in the contact zones under pressure.

[0033] Embodiments described here also concern a method to apply an adhesive on articles. The method provides:

- to support and move the articles in a direction of movement;
- to supply a substrate in strip form, which is provided on one surface with the adhesive;
- to apply, on said articles, part of the adhesive present on the substrate, putting the substrate in contact with the adhesive on the articles;
- to separate the substrate from the articles, leaving on the latter part of the adhesive present on the substrate;
- after the separation, to recover the residual adhesive still present on the substrate by means of a recovery device.

[0034] The method according to the invention thus allows to apply the adhesive simply and efficiently on articles with different shapes and forms, and at the same time to limit the waste and discards of material. Because the adhesive is recovered and is separated from the substrate, it is possible to recycle and re-use both for subsequent applications.

[0035] According to other embodiments the method provides to use the substrate from which the residue adhesive has been removed to coat the articles already provided with adhesive, thus preventing dust and dirt from depositing thereon and restricting the adhesive properties.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a lateral schematic view of an apparatus to apply an adhesive in accordance with some embodiments of the present invention;
- fig. 2 is a schematic view of the steps to apply an adhesive on an article in the apparatus of fig. 1 in a view from above, which shows the correlated modifications made to the substrate in the upper part, and to the article in the lower part.

[0037] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0038] Embodiments described here with reference to fig. 1 concern an apparatus 10 to apply an adhesive 14 on an article 12.

[0039] The article 12 can be, for example, a flat or flat-

tened object, such as an insole for a shoe, a washer, a crest, a decoration, a sign element, an item of clothing or a part of a piece of furniture, or an object that is not flattened but rather thick and/or with a complex shape.

[0040] According to some embodiments, the article 12 can either be solid or it can be provided with one or more holes, slits, indentations, with more or less complex shapes.

[0041] The apparatus 10 comprises a member 20 to support and move the articles 12.

[0042] The support and movement member 20 is provided with a support surface 22 on which to dispose and move the articles 12 in a predefined direction of movement M.

[0043] According to some embodiments, the support and movement member 20 comprises a conveyor belt 36 having a closed-ring development.

[0044] The conveyor belt 36 can be wound on at least two rollers 37, 38. At least one of the two rollers, in this case the roller 37, is a motorized roller, that is, connected to a motor member 39. The other roller 38 can also be motorized or idle.

[0045] According to some embodiments, the two rollers 37, 38 have respective axes of rotation parallel to one another, disposed substantially horizontally.

[0046] The at least two rollers 37, 38 define at least one support branch 40 and a return branch 41 of the conveyor belt 36.

[0047] According to other embodiments, the support branch 40 defines the support surface 22 for the articles 12.

[0048] According to some embodiments, the conveyor belt 36 is provided with an extremely bright surface, having, for example a degree of at least 92 gloss, which makes it perfectly anti-adhesive, preventing the adhesive 14 from remaining adherent thereto.

[0049] By degree of gloss we mean the degree of gloss or brightness of the surface of the material.

[0050] According to some embodiments, the conveyor belt 36 can be made of a silicone material having a hardness comprised between 20 and 70 ShoreA, an elongation comprised between 150% and 200%, and excellent characteristics of the adhesion mixture to the synthetic/plant fibers.

[0051] According to possible solutions, the conveyor belt 36 can be defined by a support coupled with a layer of silicone which provides the brilliant surface finish. This allows to apply the adhesive uniformly even on articles having a complex shape, or even having holes or cracks, without the excess adhesive being transferred to the conveyor belt 36.

[0052] The support of the conveyor belt 36 can comprise at least one of either felt, cotton, or silicone foam.

[0053] According to some embodiments, the layer of silicone can be coupled by extruding it on the support.

[0054] By way of example, the thickness of the layer of silicone on the support can be comprised between 1mm and 36mm.

[0055] According to some embodiments, the layer of silicone can have a degree of hardness comprised between about 42 and 62 ShoreA.

[0056] According to other embodiments, the layer of silicone can have a yield strength of about 7.5 MPa.

[0057] In this way the absolute detachment is guaranteed of any adhesive product, for example acrylic, even extremely sticky, from the conveyor belt 36.

[0058] This therefore ensures that the conveyor belt 36 remains clean and can continuously feed new articles 12 so as to carry out in succession a plurality of operations to apply the adhesive 14 without requiring maintenance and cleaning interventions on the conveyor belt 36, and in particular on the support surface 22.

[0059] According to other embodiments, the conveyor belt 36 can be holed. In this case, the apparatus 10 can comprise vacuum generation devices 42 operating in correspondence with the support branch 40 so as to create a suction which acts on the articles 12 disposed thereon and keep them adherent to the support surface 22, preventing unwanted movements thereof.

[0060] The apparatus 10 also comprises a supply device 24 that supplies a substrate 26 in the form of a strip, which is provided on one surface with the adhesive 14.

[0061] According to some embodiments, the supply device 24 can comprise an unwinding device, or mandrel holder 25, on which a coil of substrate 26 is positioned, possibly already provided on one surface with the adhesive 14.

[0062] The mandrel holder 25 can be connected to a motor member, not shown, configured to make it rotate around an axis of rotation X1 in such a way as to unwind the coil of substrate 26.

[0063] According to possible solutions, the substrate 26 can be a strip of paper, more or less thick, possibly covered with silicone or plastic material, at least on the surface on which the adhesive 14 is disposed.

[0064] For example, according to possible embodiments, the adhesive 14 can be an acrylic adhesive in the form of a solvent spread on a substrate 26 of bisiliconated paper.

[0065] The adhesive 14 can be spread with uniform thickness on the substrate 26, and subsequently dried with a passage in a drying tunnel according to parameters of time, speed, temperature and ventilations set and adjusted according to one or more of: type of adhesive 14, thickness of the adhesive 14, type of substrate 26, type of article 12, or other variables.

[0066] According to some embodiments, the apparatus 10 comprises an applicator device 28 configured to apply part of the adhesive 14 present on the substrate 26 on the article 12.

[0067] According to some embodiments, for example visible in fig. 2, the substrate supply device 24 can be configured to unwind the coil of substrate 26 provided with the adhesive 14, feeding it to the applicator device 28 located downstream along a path P of the substrate 26 along the apparatus 10.

[0068] According to some embodiments, the applicator device 28 can comprise a distributor roller 29 on which the substrate 26 partly winds with the surface on which there is the adhesive 14, facing outward.

[0069] According to some embodiments, the distributor roller 29 can be configured to rotate around a central axis of rotation X2, substantially horizontal and orthogonal to the direction of movement M, taking the adhesive 14 into contact with the article 12. The central axis of rotation X2 is disposed substantially parallel to the axis of rotation X1 of the mandrel holder 25.

[0070] According to some embodiments, the distributor roller 29 can be driven by the same motor member as the mandrel-holder 25, by means of suitable motion reduction and transfer means, not shown.

[0071] According to other embodiments, independent motors can be provided for each component.

[0072] According to some embodiments, the distributor roller 29 can have a cylindrical shape.

[0073] According to variant embodiments, shown for example in fig. 2, the distributor roller 29 can be shaped, and have protruding portions 44 defining pressure zones of the distributor roller 29 on the substrate 26 and hence on the article 12.

[0074] According to some embodiments, the protruding portions 44 can be alternated with non-protruding portions 45.

[0075] The protruding portions 44 have a first radius R1 bigger than a second radius R2 of the non-protruding portions 45 with respect to the central axis of rotation X2.

[0076] According to some embodiments, the protruding portions 44 can have a shape corresponding to the shape of the article 12 to be coated, so as to exert a uniform pressure thereon, guaranteeing the correct application of the adhesive 14.

[0077] According to possible variants, the protruding portions 44 can be disposed along the central axis of rotation X2 separated by the non-protruding portions 45.

[0078] In this way it is possible, for example, to simultaneously coat several articles 12 disposed aligned in a direction of alignment A orthogonal to the direction of movement M.

[0079] In the case shown in fig. 2, for example, there are three articles 12 and the distributor roller 29 has three protruding portions 44 in a position consistent with them.

[0080] According to other embodiments, the applicator device 28 comprises presser means 46 configured to press the substrate 26 and hence the adhesive 14 onto the article 12.

[0081] According to some embodiments, the presser means 46 are configured to exert a force in a direction orthogonal to the direction of movement M.

[0082] According to some embodiments, the presser means 46 are connected to and act on the distributor roller 29.

[0083] According to possible solutions, the presser means 46 can comprise elastic members, or springs.

[0084] According to variant embodiments, the presser

means 46 can comprise a linear actuator, drivable according to requirements.

[0085] For example, if the article 12 has a uniform thickness, it could be sufficient to position the applicator device 28 in such a way that between the distributor roller 29 and the support surface 22 a slit is formed with a height consistent with the overall thickness of the article 12 and the adhesive 14, so that the reciprocal coupling between them occurs thanks to the passage in said slit.

[0086] If the article 12 has a non-uniform thickness, the presser means 46 are advantageous since they allow to compensate great differences in thicknesses, for example more than 5mm, and possibly up to 10mm.

[0087] According to other embodiments, the apparatus 10 can also comprise a contrast unit 48, configured to exert a contrast force opposite the force exerted by the presser means 46 of the applicator device 28.

[0088] According to possible solutions, the contrast unit 48 can comprise a plurality of rollers 49, disposed in correspondence with the side of the support branch 40 opposite the support surface 22, in a position coordinated with that of the applicator device 28.

[0089] According to some embodiments, the apparatus 10 also comprises a separation device 30, disposed downstream of the applicator device 28, and configured to separate the substrate 26 from the article 12, together with the residual adhesive 14.

[0090] By "residual adhesive" here and hereafter in the description, we mean the adhesive which remains attached to the substrate 26 downstream of the applicator device 28, which generally has a shape with the shape of the article 12 itself, but in negative.

[0091] According to some embodiments, the separation device 30 can comprise a deflector element 50, or tile, suitable to define an angular deviation of the path P for moving the substrate 26, moving it away from the article 12 and from the support surface 22.

[0092] According to some embodiments, the deflector element 50 is wedge shaped, with an angled end suitable to define a deviation for the substrate 26 along the path P.

[0093] According to some embodiments, the deflector element 50 comprises a first wall 51a parallel to the support surface 22, below which the substrate 26 can transit with its free surface without the adhesive 14 in contact with the deflector element 50 and with the surface provided with the adhesive 14 in contact with the article 12.

[0094] In accordance with possible solutions, the first wall 51a can be configured to exert pressure on the substrate 26.

[0095] According to some embodiments, the deflector element 50 also comprises a second wall 51b angled by an acute angle with respect to the first wall 51a.

[0096] The separation device 30 can also comprise a separator roller 52, suitable to define an end-of-travel for the substrate 26 in the direction of feed M, facilitating the separation from the article 12.

[0097] According to some embodiments, the separator roller 52 can have anti-adherent properties, obtained, for

example, by plasma/silicone treatment.

[0098] According to some embodiments, the separator roller 52 rotates around its own axis and in doing so obliges the article 12, which is made to pass under it by means of the support and movement member 20, to remain stationary in position, while the substrate 26 follows the deflector element 50, adjacent to the second wall 51b.

[0099] According to other embodiments, combinable with the previous ones, the separation device 30 can comprise injector devices 54 configured to generate a stream of air with controlled pressure against the substrate 26, so as to move it away from the separator roller 52, and take it into contact with the second wall 51b of the deflector element 50.

[0100] In accordance with other embodiments, the separator device 30 can comprise a heating device provided to heat the adhesive 14 present on the substrate 26 in a localized manner and to facilitate the separation of the substrate 26 from the article 12.

[0101] In particular, it can be provided that the heating device heats the adhesive 14 in the zones of the substrate 26 where the article 12 is not present.

[0102] According to a possible solution, the heating device comprises a laser heat source provided to heat the adhesive 14 in a localized manner.

[0103] In variant embodiments, the heating device can be chosen from a group comprising at least one of either a hot wire heating element, an electrical resistance, infrared or induction heating elements.

[0104] According to one aspect of the present invention, the apparatus 10 also comprises, downstream of the separation device 30, a recovery device 32, configured to clean the substrate 26 separated from the article 12, removing the residual adhesive 14 from it.

[0105] According to these embodiments, the apparatus 10 defines a continuous path P to move the substrate 26 from the substrate supply device 24 to the recovery device 32.

[0106] According to some embodiments, the recovery device 32 comprises a collection roller 56 around which the substrate 26 is at least partly wound, with the surface provided with the adhesive 14 facing toward the collection roller 56 itself.

[0107] The collection roller 56 can be connected, or associated with a motor member, not shown, configured to make it rotate, so as to feed forward the substrate 26 partly wound thereon.

[0108] To allow the inversion of the orientation of the substrate 26 and the adhesive 14 between the separation device 30 and the recovery device 32, one or more return rollers 58 can be provided.

[0109] According to some embodiments, the collection roller 56 has an external surface and high adhesive characteristics, suitable to completely retain all the residues of adhesive 14 remaining on the substrate 26.

[0110] In this way it is possible to completely clean the siliconed surface of the substrate 26, making it possible to use it.

[0111] According to some embodiments, a tank 60 can be associated with the collection roller 56, in which the residual adhesive 14 removed from the substrate 26 can be collected, to be possibly re-used.

[0112] According to some embodiments, the recovery device 32 can comprise a removal member 62 suitable to remove the adhesive 14 from the collection roller 56, possibly during the rotation of the latter, and accumulating it in the tank 60.

[0113] According to possible solutions, the removal member 62 can comprise at least one of either a spatula, a doctor blade or suchlike, acting on the external surface of the collection roller 56.

[0114] According to other embodiments of the invention, the apparatus 10 also comprises a coating device 34, located downstream of the recovery device 32 and configured to coat the articles 12 with the substrate 26 from which the residual adhesive 14 has been removed.

[0115] According to some embodiments, the apparatus provides a continuous path P for the substrate 26 from the substrate supply device 24 to the coating device 34, without interruptions or cuts.

[0116] According to some embodiments, the coating device 34 comprises an alignment roller 64 on which the substrate 26 is at least partly wound, with the free surface in contact with it and the siliconed surface facing toward the article 12.

[0117] The alignment roller 64 in particular is positioned at a distance from the support surface 22 such as to define a gap consistent with the height of the article 12 and the thickness of the adhesive 14, so as to allow the substrate 26 to adhere to the adhesive 14 itself when the article 12 transits in said gap.

[0118] The alignment roller 64 exerts, during use, a pressure of the substrate 26 on the article 12.

[0119] Embodiments described here also concern a method to apply an adhesive 14 on an article 12.

[0120] The method provides to support and move one or more articles 12 in a direction of movement M. In particular, the method can provide to feed the articles 12 toward the applicator device 28 on the support surface 22.

[0121] The method also provides to supply a substrate 26 in the form of a strip provided on its surface with the adhesive 14, and to apply on the articles 12 part of the adhesive 14 present on the substrate 26 by putting the substrate 26 and the adhesive 14 in contact on the articles 12.

[0122] As can be seen in fig. 2, upstream of the applicator device 28, the adhesive 14 is uniformly disposed on the substrate 26, and the articles 12 are free of adhesive 14.

[0123] Downstream of the applicator device 28, the article 12 is provided with the adhesive 14.

[0124] Downstream of the applicator device 28, the method provides to separate the substrate 26 from the article 12 by means of a separation device 30, leaving on the articles 12 part of the adhesive previously present

on the substrate 26.

[0125] Downstream of the separation device 30, the articles 12 provided with the adhesive 14 continue to advance on the support surface in the direction of movement M, while the substrate 26, with the residual adhesive 14 which has the shape of the article 12 in negative, is moved away from them along the path P.

[0126] According to one aspect of the present invention, downstream of the separation device 30, along the path P followed by the substrate 26, the method provides to recover the residual adhesive 14 from the substrate 26.

[0127] According to one embodiment of the invention, moreover, the method provides to coat, directly in line in the direction of movement M, the articles 12 already provided with the adhesive 14, with the same substrate 26 from which the residual adhesive 14 has been removed.

[0128] According to some solutions, the method then provides to return the cleaned substrate 26 toward the support surface 22, and to coat with it the adhesive 14 provided on the articles 12 by means of the coating device 34.

[0129] According to possible variant embodiments, the method can provide to wind the cleaned substrate 26 in the form of coils, to subsequently re-use it.

[0130] In accordance with other embodiments, downstream of the coating device 34, the method can provide to collect the articles 12 provided with the adhesive 14 and the substrate 26, and possibly to remove the excess substrate 26 therefrom.

[0131] It is clear that modifications and/or additions of parts can be made to the apparatus 10 and the method to apply an adhesive on articles 12 as described heretofore, without departing from the field and scope of the present invention.

[0132] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of apparatus 10 and the method to apply an adhesive on articles 12, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Apparatus to apply an adhesive (14) on articles (12), **characterized in that** it comprises:

- a support and movement member (20) configured to support said articles (12) and make them move forward in a direction of movement (M);
- a delivery device (24) to deliver a substrate (26) in the form of a strip, which is provided on one surface with said adhesive (14);
- an applicator device (28) configured to apply part of the adhesive (14) present on said substrate (26) onto said articles (12);

- a separation device (30) to separate said substrate (26), together with the residual adhesive (14), from said articles (12); and
- a recovery device (32) to recover said residual adhesive (14) present on said substrate (26), positioned downstream of said separation device (30).

2. Apparatus as in claim 1, **characterized in that** it comprises a coating device (34) located downstream of said recovery device (32) and configured to coat said articles (12) with said substrate (26) from which said residual adhesive (14) has been removed.

3. Apparatus as in claim 1 or 2, **characterized in that** said support and movement member (20) of the articles (12) comprises a closed-ring conveyor belt (36) wound on at least two rollers (37, 38), said conveyor belt (36) having an anti-adhesive surface defining a support surface (22) for said articles (12).

4. Apparatus as in any claim hereinbefore, **characterized in that** said applicator device (28) comprises presser means (46) configured to press said substrate (26) and said adhesive (14) on said article (12) and toward said support and movement member (20).

5. Apparatus as in any claim hereinbefore, **characterized in that** said applicator device (28) comprises a distributor roller (29) on which said substrate (26) partly winds with the surface on which said adhesive (14) is present facing toward the outside.

6. Apparatus as in claim 5, **characterized in that** said distributor roller (29) is shaped and has protruding portions (44) defining pressure zones of said distributor roller (29) on said substrate (26) and said article (12).

7. Apparatus as in any claim hereinbefore, **characterized in that** said recovery device (32) comprises a collection roller (56) around which said substrate (26) is at least partly wound, with the surface provided with said residual adhesive (14) in contact with said collection roller (56), **and in that** said collection roller (56) has an external surface with adhesive properties suitable to retain the residues of adhesive (14) present on said substrate (26).

8. Apparatus as in any claim hereinbefore, **characterized in that** said separation device (30) comprises a deflector element (50) suitable to define an angular deflection of the movement path (P) of said substrate (26) with respect to said direction of movement (M), and a separator roller (52), suitable to define an end-of-travel for said substrate (26) in said direction of movement (M), facilitating its separation from said

article (12).

9. Apparatus as in any claim hereinbefore, **characterized in that** said separation device (30) comprises a heating device provided to heat in a localized way the adhesive (14) present on said substrate (26) and promote the separation of said substrate (26) from said article (12). 5
10. Method to apply an adhesive (14) on articles (12), **characterized in that** it provides: 10
- to support and move one or more articles (12) in a direction of movement (M);
 - to supply a substrate (26) in strip form, which is provided on one surface with said adhesive (14); 15
 - to apply, on said articles (12), part of said adhesive (14) present on said substrate (26), putting in contact said substrate (26) and said adhesive (14) on said articles (12); 20
 - to separate said substrate (26) from said articles (12), leaving on the latter part of the adhesive (14) present on said substrate (26);
 - after said separation, to recover the residual adhesive (14) still present on said substrate (26) by means of a recovery device (32). 25
11. Method as in claim 10, **characterized in that** it provides to coat, directly in line along said direction of movement (M), said articles (12) already provided with said adhesive (14) with the same substrate (26) from which said residual adhesive (14) has been removed. 30

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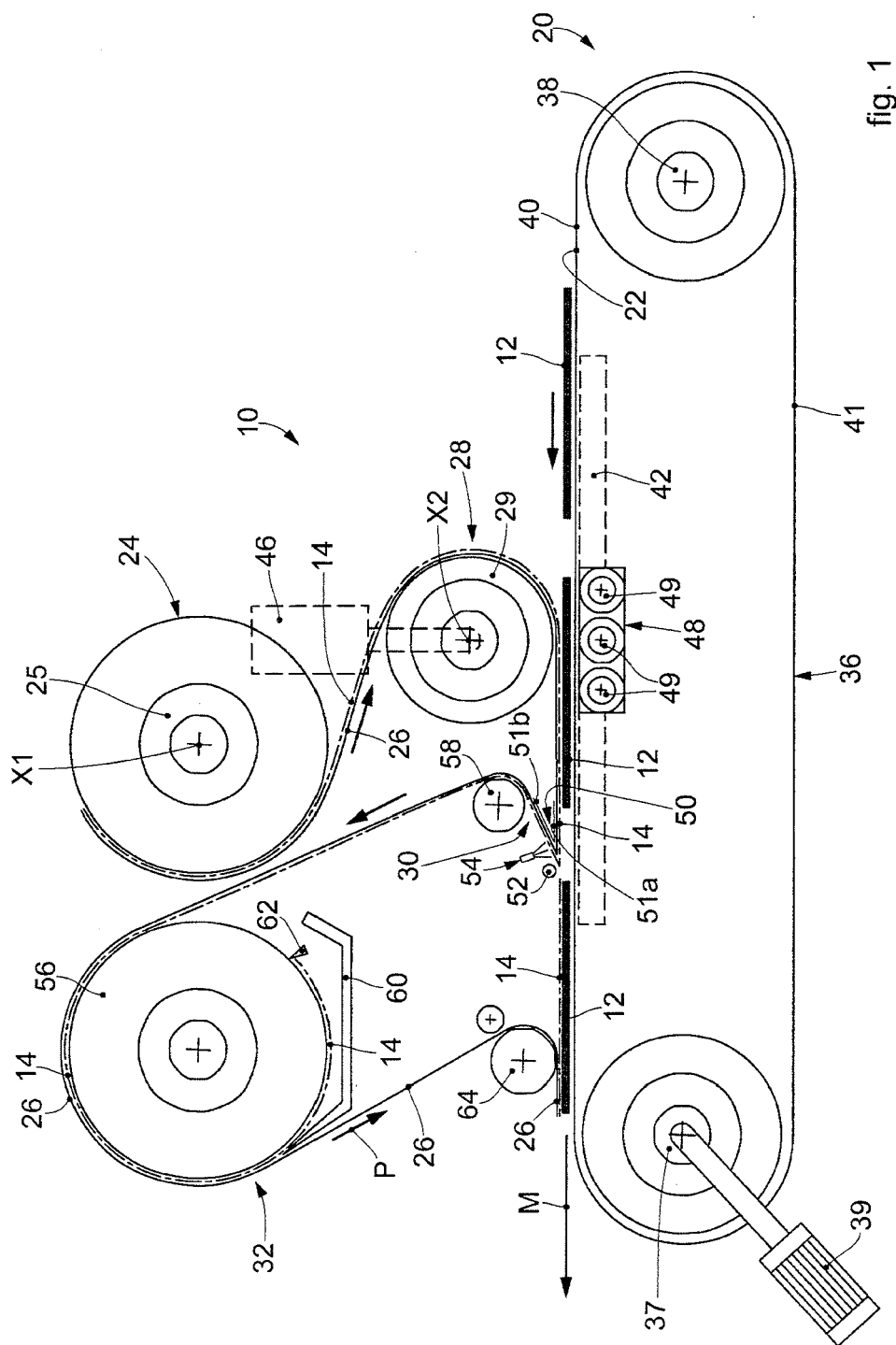
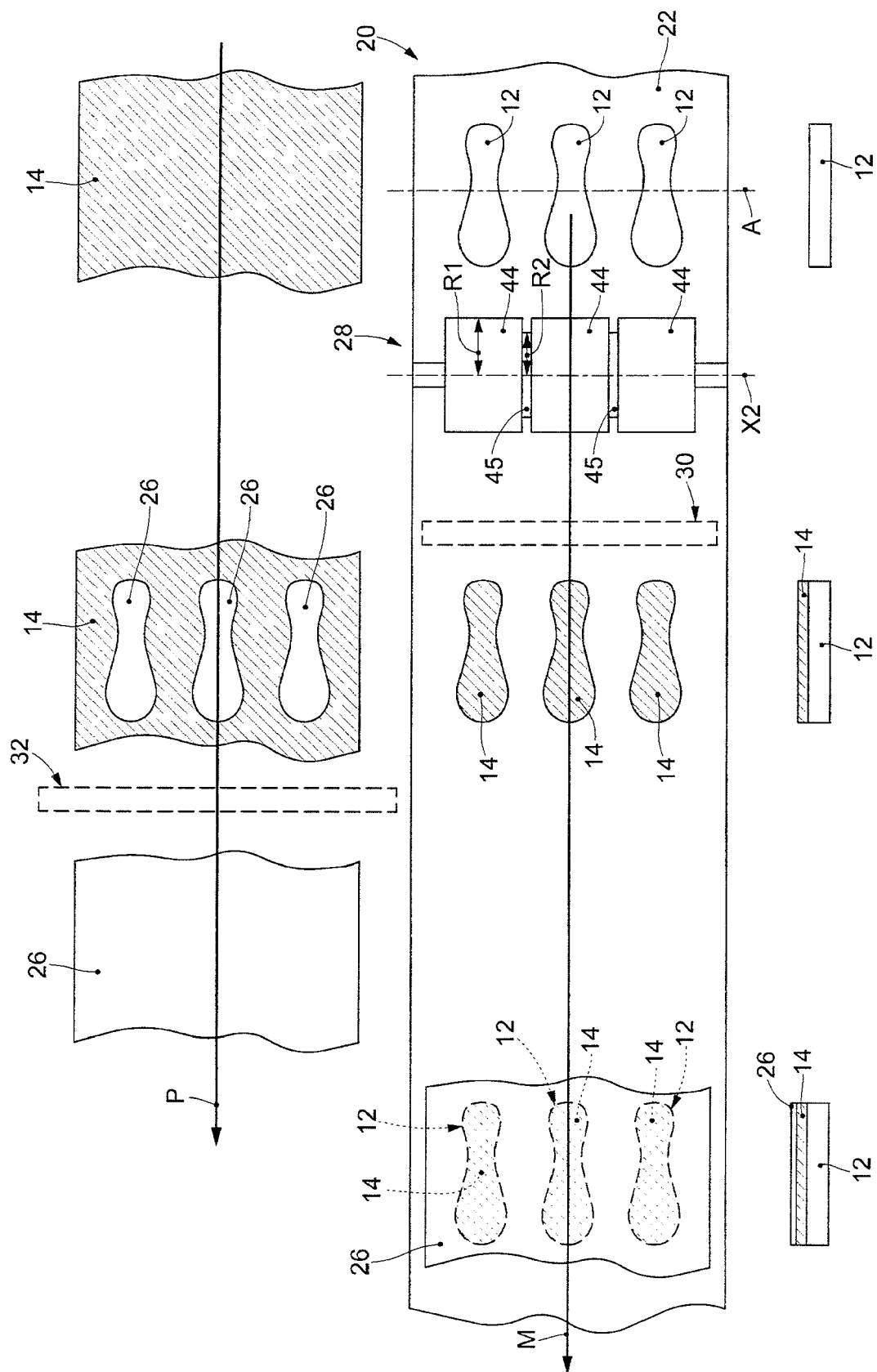


fig. 1





EUROPEAN SEARCH REPORT

 Application Number
 EP 18 19 3064

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 January 2019	Examiner Baysal, Kudret
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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