



EUROPEAN PATENT APPLICATION

(43) Date of publication:
26.01.2022 Bulletin 2022/04

(51) International Patent Classification (IPC):
B65B 11/02 ^(2006.01) **B65B 11/04** ^(2006.01)

(21) Application number: **21185827.9**

(52) Cooperative Patent Classification (CPC):
B65B 11/025; B65B 11/045

(22) Date of filing: **15.07.2021**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **BRUNI, Valeriano**
47824 Poggio Torriana (RN) (IT)
• **FORNI, Angelo**
47824 Poggio Torriana (RN) (IT)
• **PACI, Gianluca**
47824 Poggio Torriana (RN) (IT)

(30) Priority: **22.07.2020 IT 202000017749**

(74) Representative: **Cacciamani, Clizia**
Innova & Partners S.r.l.
Via Cola di Rienzo, 265
00192 Roma (IT)

(71) Applicant: **Atlanta Stretch S.p.A.**
47824 Poggio Torriana (RN) (IT)

(54) **EQUIPMENT AND METHOD FOR AUTOMATICALLY WRAPPING A FILM AROUND AN OBJECT**

(57) The present invention refers to an equipment and a method for wrapping a film (6) around an object (4) placed on a pallet.

The equipment includes: a) a reel-holder carriage (1) equipped with an outlet (11) designed to allow the film (6) to come out of the carriage (1) through it; and b) at least one device (7,8) suitable for blowing air, placed at the outlet (11) and integral with the carriage (1), which allows the end strip (9) of the film, once it has come out of the carriage (1), to spread slowly, without any tension,

on the ground around the base of the object (4) to be wrapped.

The rotation around the object (4) to be wrapped of a movable body forming part of the equipment of the present invention, or, alternatively, the rotation on itself of the object to be wound in proximity to the equipment, allows tensioning of the strip of the film (6) and the subsequent superimposition on it of a portion of the film that gradually emerges from the carriage (1) during rotation, so as to fix the film to the object to be wrapped.

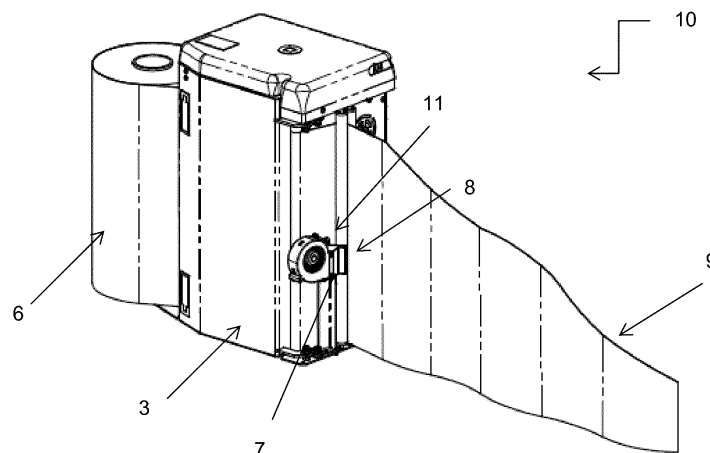


Figura 3

Description

Field of the invention

[0001] The present invention refers to an equipment and a method for wrapping a film around an object. In particular, the present invention relates to an equipment and a method for automatically wrapping a film around an object placed on a pallet, wherein the equipment is able, first of all, to deposit a tension-free strip of film around the base of the object to be wrapped and, subsequently, to compress this strip of film around the object itself.

State of art.

[0002] Wrapping equipment can be classified into semi-automatic and automatic.

[0003] With semi-automatic wrapping equipment, particularly suitable for low production, we mean that equipment wherein the intervention of the operator is required at each packaging cycle to bring the object to be wrapped A or equipment B in the wrapping position (see Figure 1a, and Figure 1b, respectively), to hook the film to the object to be wrapped A, start the wrapping, cut the film at the end of the cycle and take the object to be wrapped A or move the equipment B to a new place. With reference to Figure 1b and in particular to the mobile elements of equipment B that rotate around the stationary object, there are no automatic coupling systems; it is always the operator who fixes the film to the object to be wrapped before starting the wrapping cycle. Figure 1c shows another semi-automatic wrapping equipment known in the art wherein the film rotates around the object to be wrapped fixed to the ground by means of a rotating arm 18. Automatic wrapping equipment (for high productions) mean that equipment integrated in packaging lines where all the operations are automated, that is: handling of the object to be wrapped, hooking of the film to the object to be wrapped at the beginning of the cycle, wrapping the object in the desired mode, cut of the film at the end of the cycle. The operator must perform only the functions of checking and replenishing the consumable material.

[0004] There is also hybrid equipment that are halfway between the two types of equipment described above where, starting from semi-automatic equipment, in order to speed up the cycle and to reduce human intervention, we try to automate only some operations with the "addition of devices such as automatic cutting or automatic cutting and hooking, indicated with 16 and 17 in Figure 2a.

[0005] For example, with reference to Figure 2a and in particular to fixed station equipment, automatic and semi-automatic equipment known in the art for wrapping objects with stretch film are shown. They are typically composed of a reel-holder carriage 1 that houses the film 6; a vertical column 2 along which the reel-holder carriage 1 moves from the bottom up and vice versa; a base 3

that makes the object to be wrapped rotate on itself 4 resting on a pallet 15. When the film 6 is hooked to the object 4 or to a system 5 that holds it integral with it, the rotation of the object 4 to be wrapped puts the end strip 9 of the film 6 in tension between the object to be wrapped 4 and the reel-holder carriage 1. The tension of the end strip 9 of the film 6 activates the reel-holder carriage 1 that then dispenses the film 6. Due to the rotation and vertical movement of the reel-holder carriage 1 along the column 2, the object to be wrapped 4 is wrapped in a spiral.

[0006] In the equipment where the automatic hooking of the film 6 is provided (Figure 2a), at the beginning of the cycle, the latter is hooked to a system 5. At start-up, the film 6 is essentially tensioned by the rotation movement and consequently extracted from the carriage 1; for this reason, the system 5 that holds the film 6 must guarantee a sufficient seal to keep it under tension. Once the reels of the extensible film 6 have overlapped around the object to be wrapped 4, the system 5 releases the film 6, and then resumes it at the end of the cycle for the next wrapping; it must, therefore, be governed in the various stages of wrapping.

[0007] The addition of these components clearly entails the addition of costs and complications.

[0008] Therefore, the Applicant has posed the technical problem of providing an equipment for the automatic wrapping of a film around an object placed on a pallet, so as to obtain a simple system for dispensing the film, and a system for hooking the film. to the product to be wrapped and wrapping it around the object to be wrapped.

Summary of the invention

[0009] In a first aspect, the present invention refers to an equipment for wrapping a film around an object placed on a pallet such as that detailed in claim 1.

[0010] The Applicant of the present application has in fact surprisingly found that the technical problem encountered above can be solved in an effective and reliable way by means of an equipment for wrapping a film around an object arranged on a pallet, wherein said equipment comprises: a) a carriage adapted to house a reel of said film and wherein said carriage is provided with an outlet adapted to allow said film to exit from the carriage through it; and b) at least one device suitable for blowing air, placed in correspondence with said outlet and integral with said carriage, and able to allow the terminal strip of said film, once it has come out of the carriage, to stretch on the ground around the base of said object to be wrapped with said film.

[0011] In this way, thanks to the presence of said device designed to blow air, the strip of the film, once released from the carriage, initially lies slowly around the object to be wrapped on the pallet, without any tension.

[0012] According to a preferred embodiment, said equipment is provided with a first and a second device

suitable for blowing air, placed one on each side with respect to the film at said outlet of the carriage.

[0013] In this way, the air flow generated by said first and second devices designed to blow air runs parallel to the film itself and guarantees its exit from the carriage. Consequently, the first section of the terminal strip of the film, due to the effect of the air flow, initially remains horizontal, and then moves away from the air puffs and naturally descends downwards, resting slowly, without tension, at the base of the object to be wrapped.

[0014] According to another preferred embodiment, said equipment is provided with a single device suitable for blowing air. Preferably, said only one device suitable for blowing air is positioned under the film outlet.

[0015] In this way the air flow is distributed to the two sides of the film itself; the air jet is thus directed in the direction of exit of the film and slightly inclined upwards to give a vertical support function.

[0016] According to a preferred embodiment, said equipment is also provided with at least one suction element located at the base of said object to be wrapped.

[0017] In this way, said at least one suction element is capable of attracting said end strip of the film towards it once it has come out of said carriage outlet. This facilitates the subsequent wrapping of the end strip of the film around the object to be wrapped.

[0018] According to a preferred embodiment, said equipment is further provided with a movable body, integral with said carriage, and able to rotate around said object to be wrapped.

[0019] In this way, the equipment of the present invention is able to rotate around said object to be wrapped with said film, consequently causing the wrapping and subsequent fixing of said film around the object itself.

[0020] In a preferred embodiment, said movable body is provided with at least one wheel to facilitate its movement. In another alternative embodiment, said movable body is operated by an articulated rotating arm, integral with said carriage, which rotates around the object to be wrapped fixed to the ground.

[0021] According to a preferred embodiment, said equipment is also provided with a vertical column along which said carriage is able to slide up and/or down.

[0022] In this way the vertical column acts as a vertical guide to the carriage.

[0023] According to a preferred embodiment, said equipment is also provided with at least one device designed to increase the friction between said film and said object to be wrapped.

[0024] In this way, the wrapping of the film around the object to be wrapped is facilitated.

[0025] According to a preferred embodiment, said equipment is also provided with at least one system for spreading said film on the object to be wrapped.

[0026] In this way, the film is distributed on the object to be wrapped more evenly.

[0027] According to a preferred embodiment, said equipment is further provided with at least one device

suitable for dispensing adhesive tape or a glue between said film and said object to be wrapped.

[0028] In this way, fixing the film on the object to be wrapped is further facilitated.

[0029] In a second aspect, the present invention relates to a method for wrapping an object placed on a pallet with a film, such as that detailed in claim 6.

[0030] The Applicant of the present application has in fact surprisingly found that the technical problem encountered above can be solved effectively and reliably by means of a method for wrapping an object placed on a pallet with a film, wherein said method uses the equipment described above with reference to the first aspect of the present invention.

[0031] In particular, the method of the present invention comprises the steps of:

a) loading a reel of said film into a special reel-holder carriage equipped with a suitable outlet so as to allow the end strip of said film to come out of the carriage through said outlet;

b) activating at least one device suitable for blowing air located in correspondence with said outlet and integral with said carriage, so as to allow said end strip of said film to stretch, without tension, around the base of said object to be wrapped;

c) activating the supply of the film still inside the carriage;

d) activating the rotation of said object to be wrapped on itself in proximity to said equipment, or, alternatively, activating the rotation of said movable body of said equipment around said object to be wound, so that said end strip of said film begins to wrap around said object to be wrapped, and with it, thereafter, also the remaining portion of film gradually coming out of said carriage;

e) continuing to carry out said rotation until an amount of film has been dispensed such as to be tensioned so as to fix said film to said object to be wrapped.

[0032] In this way, the method allows the strip of the film, once released from the carriage, to initially lay slowly around the object to be wrapped on the pallet, without any tension.

[0033] Subsequently, thanks to the rotation of the mobile body of the equipment with respect to the object to be wrapped or, alternatively, thanks to the rotation on itself of the object to be wrapped, placed on the pallet with respect to the equipment, the strip of the film is stretched around the object to be wrapped and fixed to it.

[0034] In one embodiment, the film is tensioned as soon as, upon completion of the first round of the film around the object to be wrapped, a portion of the film

overlaps the end strip itself.

[0035] In another alternative embodiment, it is not necessary to wait for the overlapping of the end strip by the film to take place, but the tensioning of the film can be activated as soon as the film already exiting the carriage presents a certain resistance to dragging. In any case, the tensioning of the film allows the fixing of the film itself around the object to be wrapped.

[0036] According to a preferred embodiment, in said step b) a first and a second device suitable for blowing air are activated, placed one on each side with respect to the film at said outlet.

[0037] In this way, the air flow generated by said first and second devices designed to blow air runs parallel to the film itself and guarantees its exit from the carriage. Consequently, the first section of the terminal strip of the film, due to the effect of the air flow, initially remains horizontal and then, moving away from the air puffs, naturally descends downwards, resting slowly, without tension, at the base of the object to be wrapped.

[0038] According to an alternative embodiment, in said step b) only one device suitable for blowing air is activated, positioned under the film outlet.

[0039] In this way the air flow is distributed to the two sides of the film itself; the air jet is thus directed in the direction of exit of the film and slightly inclined upwards to give a vertical support function.

[0040] According to a preferred embodiment, said method at the end of said step e) comprises the further step f) of deactivating said at least one first device designed to blow air.

[0041] In fact, once the end strip of the film has been superimposed by a further portion of the film around the object to be wrapped, it is no longer necessary for at least one device to blow air to be active.

[0042] According to a preferred embodiment, said method at the end of said step f) comprises the further step g) of continuing said rotation and, consequently said wrapping of said film around said object to be wrapped, until the object to be wrapped with said film has been wrapped for a desired number of times, according to the shape and size of the object to be wrapped.

[0043] In this way, the film is wrapped under tension and then fixed around the object to be wrapped.

[0044] According to a preferred embodiment, the speed with which said film is dispensed from said carriage in said step c) is lower than the speed of said rotation indicated in said step g).

[0045] In fact, while initially a first reduced speed is required with which the film is dispensed out of the carriage, so as to allow the puffs of air to allow the terminal strip of the film to stretch slowly around the base of the object to be wound, subsequently, once the first wrapping round of the film around the object to be wound has been completed, a higher speed is allowed to complete the wrapping of the object to be wound more quickly.

[0046] According to a preferred embodiment, once a portion of the film has been superimposed on the end

strip of the film itself around the object to be wrapped, so as to fix the film to the object to be wrapped, the supply of the film from the carriage is determined by the tension of the film itself between the object to be wrapped and the carriage.

[0047] According to a first embodiment, in said phase d), the object to be wrapped with the film is positioned on a pallet that, in turn, is positioned on a rotating base; in this embodiment, the object to be wrapped rotates on itself near the equipment, which remains fixed instead. In this case, the end strip of the film comes out of the carriage and falls slowly onto the rotating base; the rotation of the latter drags the end strip of the film around the object to be wrapped placed on the pallet, until a first round is completed, fixing it between the object to be wrapped and the film arriving from the carriage.

[0048] According to a second alternative embodiment, in said step d), it is the movable body of said equipment that rotates around the object to be wrapped placed on the pallet, which instead remains fixed to the ground. In this other case, the end strip of the film comes out of the carriage and then falls to the ground and slowly settles around the object to be wrapped; thanks to the rotation of the mobile body of the equipment itself around the object to be wrapped, the end strip of the film is wrapped around the object placed on the pallet until the further portion of film coming out of the carriage is tensioned and/or overlaps the end strip already wrapped around the object previously.

[0049] According to a preferred embodiment, the amount of film delivered by the carriage has a length slightly shorter than the path traveled by said movable body of said equipment while it rotates around the object to be wrapped.

[0050] In this way, the film is kept as tensioned as possible and close to the object to be wrapped.

[0051] Further features and advantages of the present invention will be better highlighted by examining the following detailed description of preferred but not exclusive embodiments, illustrated only by way of indication and not limited to, with the support of the attached drawings. In particular, in such drawings:

- Figure 1a is an axonometric view of a semi-automatic equipment known in the art to wrap a film around an object placed on a pallet, wherein the latter rotates around the equipment, which is instead fixed;
- Figure 1b is an axonometric view of a semi-automatic equipment known in the art for wrapping a film around an object placed on a pallet, wherein the equipment rotates around the object to be wrapped with the film, which is instead fixed;
- Figure 1c is an axonometric view of a semi-automatic equipment known in the art for wrapping a film around an object placed on a pallet, wherein the apparatus rotates around the object to be wrapped by

means of a rotating arm;

- Figure 2a is an axonometric view of a hybrid equipment known in the art to wrap a film around an object placed on a pallet, wherein the latter rotates around the equipment, which is instead fixed;
- Figure 3 is an axonometric view of a detail of an embodiment of an automatic equipment of the present invention for wrapping a film around an object placed on a pallet, wherein there are two devices suitable for blowing air;
- Figure 3b is an axonometric view of a detail of a second embodiment of an automatic equipment of the present invention for wrapping a film around an object placed on a pallet, wherein there is only one device suitable for blowing air;
- Figure 4a is an axonometric view of a system consisting of the equipment of the present invention of Figure 3 and of an object placed on a pallet to be wrapped with the film, wherein the object to be wrapped rotates on itself near the equipment;
- Figure 4b is an axonometric view of a system consisting of the equipment of the present invention of Figure 3 and an object placed on a pallet to be wrapped with the film, wherein a movable body of the equipment rotates around the object to be wrapped;
- Figures 5-9 schematically show from above the movable body of the equipment of Figure 4b during various phases of rotation around the object to be wrapped, wherein the progressive supply of the film and the relevant progressive wrapping of the object to be wrapped can be seen.

Detailed description

[0052] The following detailed description refers to particular embodiments of the device of the present invention, without limiting its content.

[0053] With reference to Figures 3, 4b, 5-9, a first embodiment of an automatic equipment 10 of the present invention is shown for wrapping a film 6 around an object 4 placed on a pallet 15 arranged on the ground.

[0054] The equipment 10 comprises a carriage 1 adapted to house a reel of film 6; the carriage 1 is equipped with an outlet 11 that allows the film 6 to come out of the carriage 1. The equipment 10 also includes a vertical column 2 along which the carriage 1 slides upwards and/or downwards. At the outlet 11 there are two devices 7,8 suitable for blowing air, placed one on each side with respect to the film 6 and integral with the carriage 1.

[0055] Finally, the equipment 10 is also provided with

a movable body 12 integral with the carriage 1 and able to rotate around the object to be wrapped 4; the movable body 12 is provided with at least one wheel 13 to facilitate its movement.

[0056] The movement of the movable body can be managed by means of an electronic card placed inside the movable body 12 itself and manageable via a keyboard and a display 14 arranged on the external surface of the movable body itself to allow programming. In another alternative embodiment, the movable body 12 can also be managed remotely, without limiting the invention to such solutions.

[0057] The movement of the carriage 1 along the vertical column, the speed with which the film 6 comes out of the carriage, the power of the devices 7,8 suitable for blowing air can also be managed and programmed by means of this electronic card, via keyboard or remotely, without limiting the invention to such solutions.

[0058] Operationally, a reel of film 6 is first loaded onto the reel-holder carriage 1, so that the end strip 9 (or "tail") of the film 6 is passed through the appropriate outlet 11 to come out of the carriage 1. The equipment 10 and the object to be wrapped 4 are then brought close to each other to start the wrapping cycle. Then, the two devices 7,8 suitable for blowing air are activated, placed at the outlet 11, one on each side with respect to the film 6 and integral with the carriage 1, to allow the extraction of the film 6. At the same time, the rotation of the mobile body 12 of the equipment 10 is activated around the object to be wrapped 4; therefore, while the movable body 12 rotates (and with it all the equipment 10 integral with it), the reel-holder carriage 1 extracts and dispenses the film. The air flow generated by the devices 7,8 runs parallel to the terminal strip 9 that, due to the effect of the air flow, initially remains horizontal, and then moves away from the air puffs 7,8 and naturally descends downwards, leaning slowly, without tension, in correspondence with the object to be wrapped 4 (Figure 5).

[0059] In a preferred form, although not essential for the purposes of the invention, the film 6 delivered by the carriage 1 has a length slightly shorter than the path traveled by the mobile body 12 while the latter rotates around the object to be wrapped 4. In this way, the film 6 is kept as tensioned as possible and close to the object to be wrapped 4. As the movable body 12 rotates around the object to be wrapped 4 (clockwise, in Figures 5-9), the end strip 9 of the film 6 is tensioned while it wraps around the object 4 itself and with it, consequently also the portion of film 6 as it exits from the carriage 1. In one embodiment, the film 6 is tensioned as soon as, upon completion of the first round of the film 6 around the object to be wrapped 4, a portion of the film 6 overlaps the end strip 9 itself. In another alternative embodiment, it is not necessary to wait for the overlapping of the end strip 9 by the film 6 to occur, but the tensioning of the film 6 can be activated as soon as the film 6 already exiting the carriage 1 has a certain drag resistance. In any case, the tensioning of the film 6 allows the fixing of the film 6 itself

around the object to be wrapped 4. The rotation of the mobile body 12 can continue until it has completed the number of rounds programmed around the object to be wrapped 4.

[0060] With reference to Figures 3,4a, a second embodiment of an automatic equipment 10 of the present invention is shown for wrapping a film 6 around an object 4 placed on a pallet 15 that, in turn, is placed on a rotating base 3. This second embodiment differs from the first one seen above with reference to Figures 4b, 5-9 in that, in this case, the object to be wrapped 4 rotates on itself in proximity to the equipment 10, which is instead fixed. Furthermore, in this second embodiment there is no mobile body 12 of the equipment 10, no movement of the equipment 10 being necessary.

[0061] Operationally, in this second embodiment, the strip 9 of the film 6 exits from the carriage 1 in the same manner as seen above with reference to the first embodiment, using the devices 7,8 to blow the air, and then fall without tension on the swivel base 3. The latter, by rotating, tensions and pulls away the strip 9 around the object to be wrapped 4 up to bring it back to the starting point, and wedges it between the object to be wrapped 4 and the new portion of film 6 coming out of the carriage 1. Also in this case, at the end of the first round of the object to be wrapped 4 around the equipment 10, the film 6 overlaps the flap 9, thus fixing the film 6 around the object to be wrapped 4. The rotation of the object to be wrapped 4 around the equipment 10 can continue until it has completed the number of rounds programmed around the object to be wrapped 4.

[0062] Of course, many modifications and variations of the preferred embodiments described above will be apparent to those skilled in the art, still remaining within the scope of the invention.

[0063] For example, the equipment of the present invention can be provided with further devices to facilitate the wrapping and fixing of the film around the object to be wrapped, such as: suction elements capable of attracting the terminal strip of the film towards them once it has come out of said carriage outlet; devices designed to increase the friction between the film and the object to be wrapped; a system for spreading the film on the object to be wrapped; a device suitable for dispensing adhesive tape or glue between the film and the object to be wrapped.

[0064] Furthermore, in another alternative embodiment of the present invention, the equipment 10 of the present invention can be provided with a single device 7 suitable for blowing air, as shown in Fig. 3b, instead of having two devices 7,8 as shown in Fig. 3. In this case, the only device 7 suitable for blowing air is positioned under the outlet of the film 6, so that the air flow is distributed to the two sides of the film 6 itself. The air jet is thus directed in the direction of outlet of the film 6 and slightly inclined upwards to give a vertical support function.

[0065] Therefore, the present invention is not limited

to the preferred embodiments described, illustrated only by way of non-limiting example, but is defined by the following claims.

Claims

1. equipment (10) for wrapping a film (6) around an object (4) arranged on a pallet (15), wherein said equipment (10) comprises:

a) a carriage (1) adapted to house a reel of said film (6) and wherein said carriage (1) is provided with an outlet (11) adapted to allow said film (6) to exit from the carriage (1) through said outlet (11); and

b) at least one device suitable for blowing air (7) placed in correspondence with said outlet (11) and integral with said carriage (1) and able to allow the end strip (9) of said film (6), once it has come out of the carriage (1), to lie on the ground around the base of said object to be wrapped (4) with said film (6).

2. equipment (10) for wrapping a film (6) according to claim 1 provided with a first (7) and a second device suitable for blowing air (8), placed one on each side with respect to the film (6) at said outlet (11) of the carriage (1).

3. equipment (10) for wrapping a film (6) according to any one of the claims above further provided with a movable body (12) integral with said carriage (1) able to rotate around said object to be wrapped (4).

4. equipment (10) for wrapping a film (6) according to any of the claims above also provided with a vertical column (2) along which said carriage (1) is able to slide up and/or down.

5. equipment (10) for wrapping a film (6) according to any one of the claims above, further provided with at least one suction element positioned at the base of said object to be wrapped (4) and able to attract said end strip (9) towards itself of the film (6) once it has come out of said outlet (11) of the carriage (1).

6. Method for wrapping an object (4) placed on a pallet (15) with a film (6) using the equipment (10) according to any one of claims 1-5, wherein said method comprises the steps of:

a) loading a reel of said film (6) into a special reel-holder carriage (1) equipped with a suitable outlet (11) so as to allow the end strip (9) of said film (6) to come out of the carriage (1) through said outlet (11);

b) activating at least one device suitable for

blowing air (7) located in correspondence with said outlet (11) and integral with said carriage (1), so as to allow said end strip (9) of said film (6) to stretch, without tension, around the base of said object to be wrapped (4); 5

c) activating the supply of the film (6) still inside the carriage (1);

d) activating the rotation of said object to be wrapped (4) on itself in proximity to said equipment (10), or, alternatively, activating the rotation of said movable body (12) of said equipment (10) around said object to be wound (4), so that said end strip (9) of said film (6) begins to wrap around said object to be wrapped (4), and with it, thereafter, also the remaining portion of film (6) gradually coming out of said carriage (1); 10 15

e) continuing to carry out said rotation until an amount of film (6) has been dispensed such as to be tensioned so as to fix said film (6) to said object to be wrapped (4). 20

7. Method according to claim 6 wherein, in said step e), said film (6) is tensioned when it overlaps said end strip (9) of said film (6) already wrapped to said object to be wrapped (4) or as soon as the film (6) already exited from the carriage (1) presents a certain resistance to dragging. 25
8. Method according to claim 7 that, at the end of said step e), comprises the further step of: 30
 - f) deactivating said at least one first device suitable for blowing air (7).
9. Method according to claim 8 that, at the end of said step f), comprises the further step of: 35
 - g) continuing said rotation and, consequently, said wrapping of said film (6) put under tension around said object to be wrapped (4), until the object to be wrapped (4) with said film has been wrapped for a number of times desired. 40
10. Method according to any one of the claims 6-9 above, wherein in said step b) a first (7) and a second device (8) suitable for blowing air are activated and placed one on each side with respect to the film (6) in correspondence with said outlet (11). 45

50

55

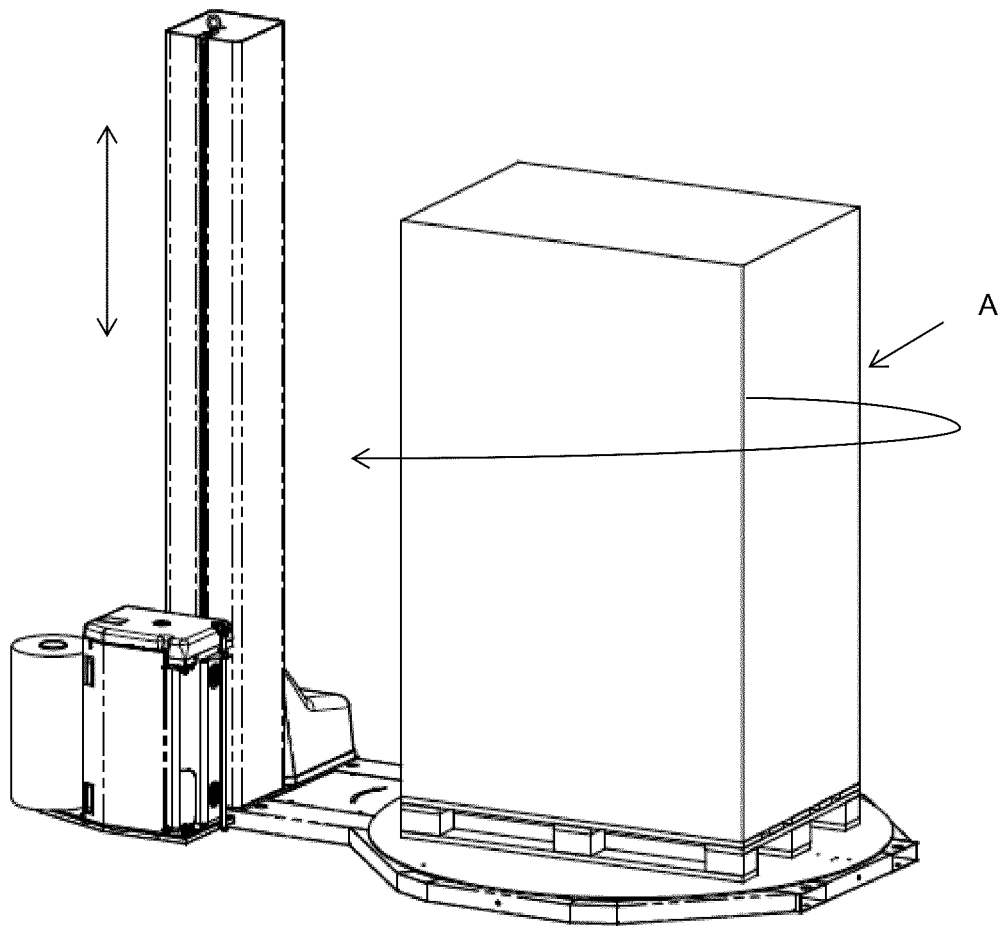


Figura 1a

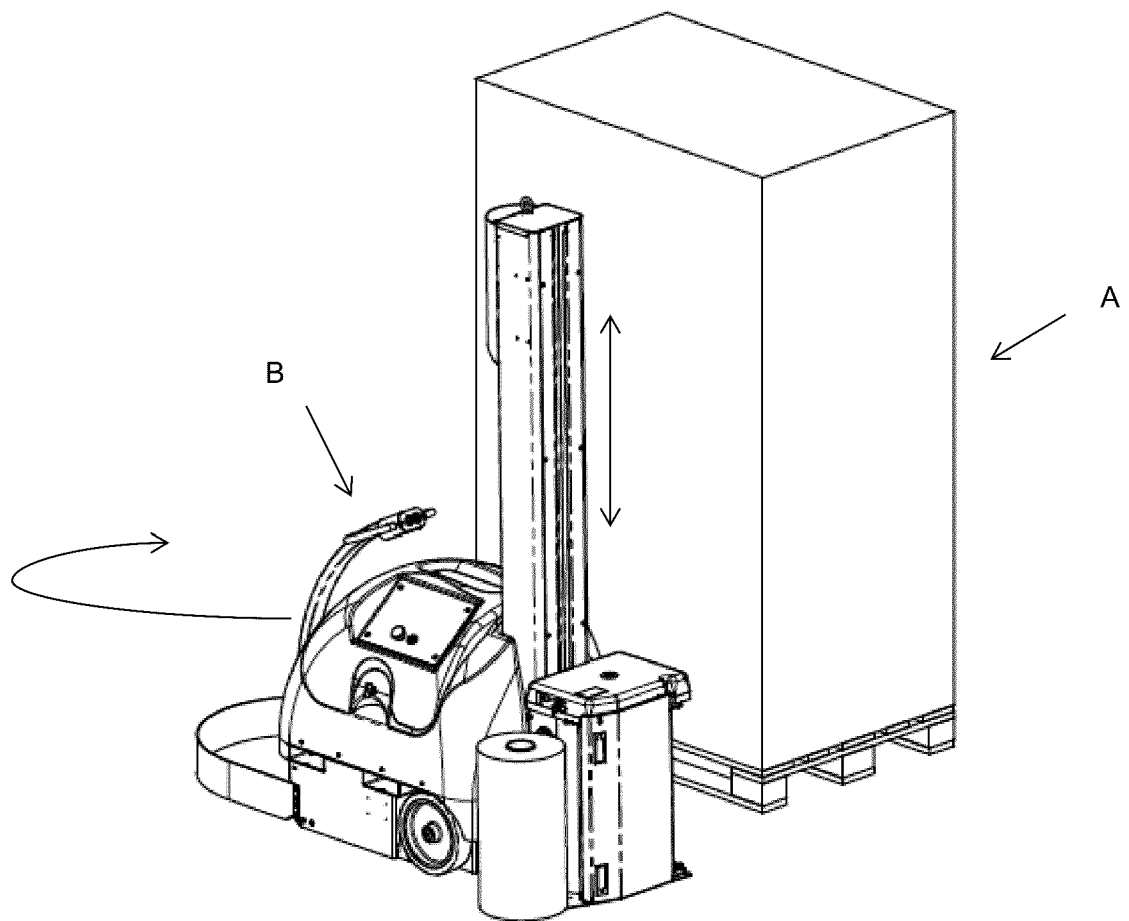


Figura 1b

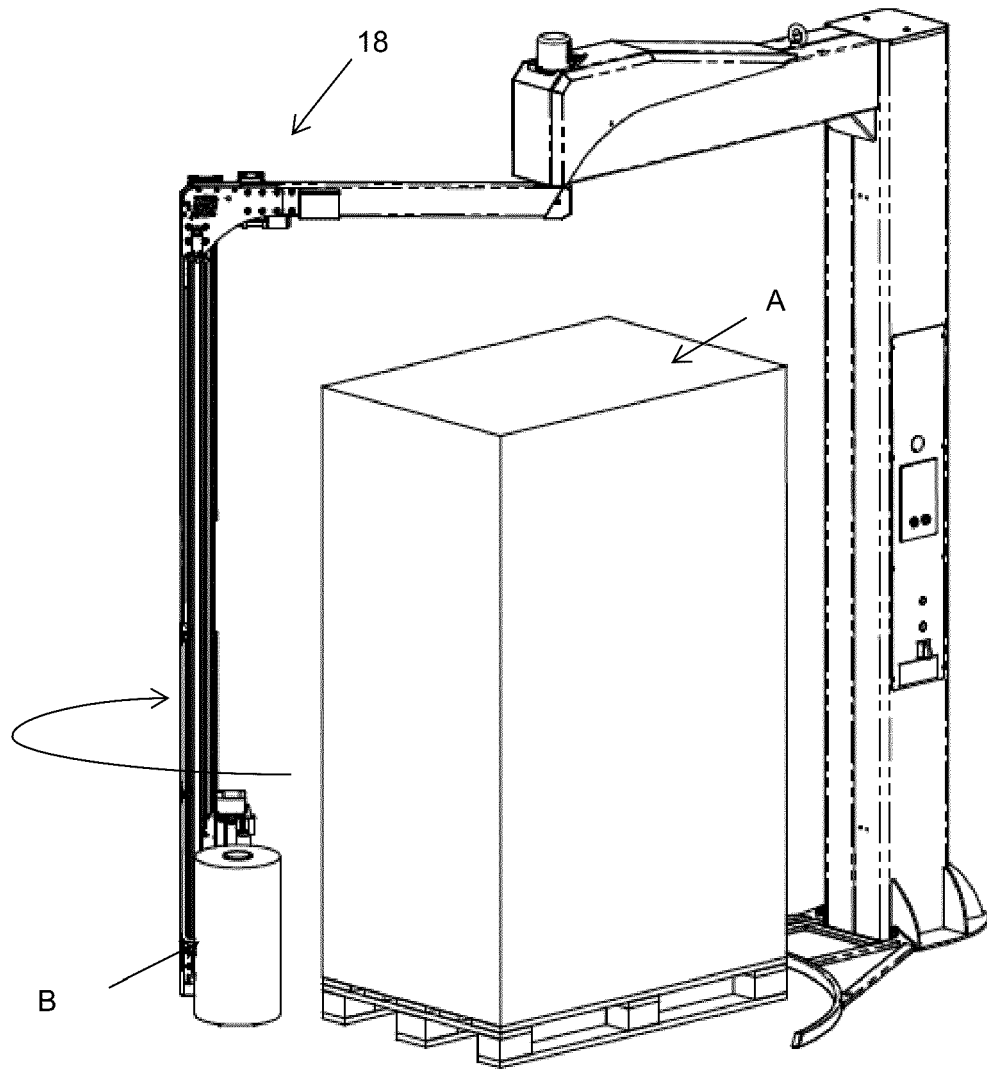


Figura 1c

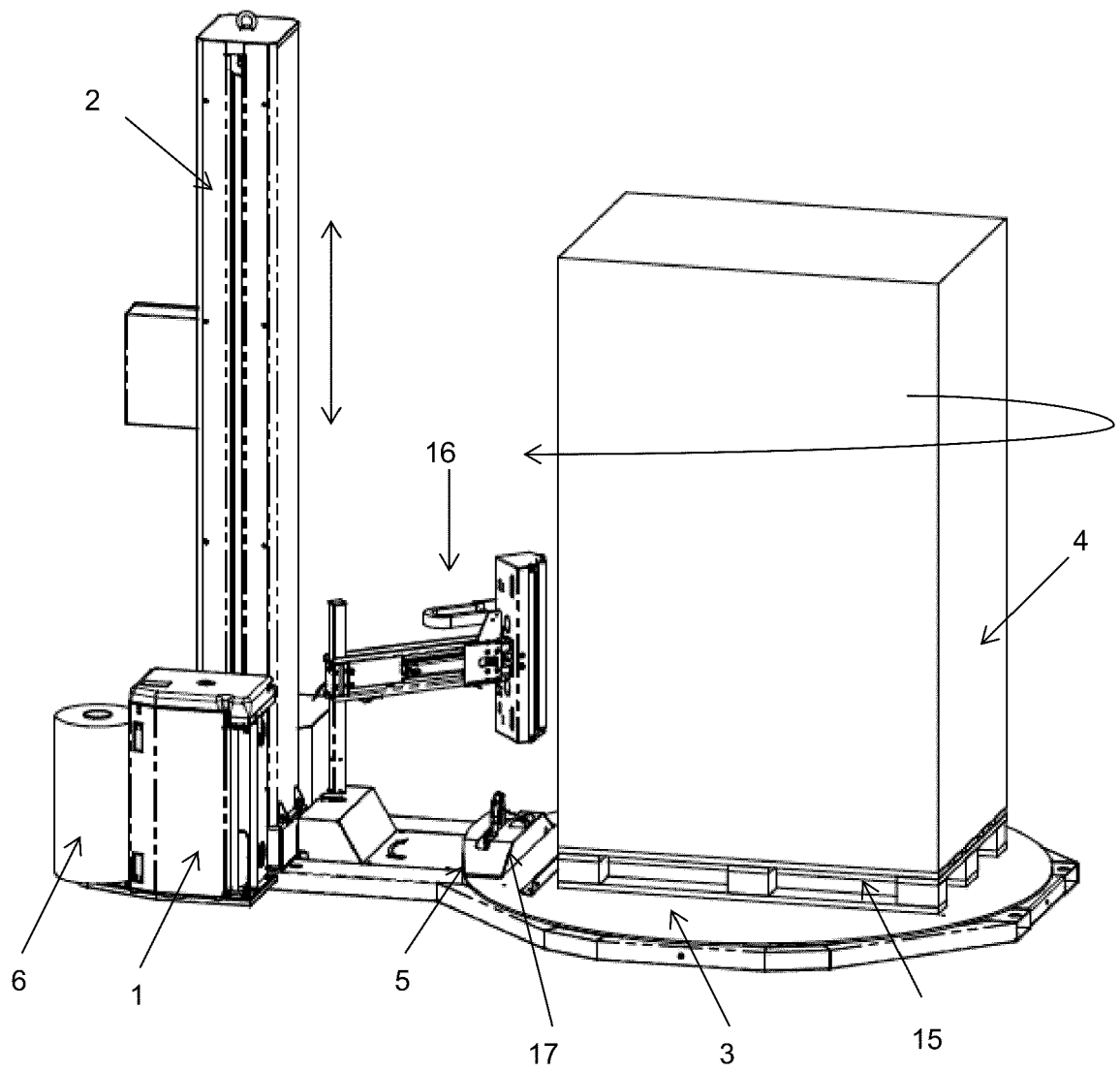


Figura 2a

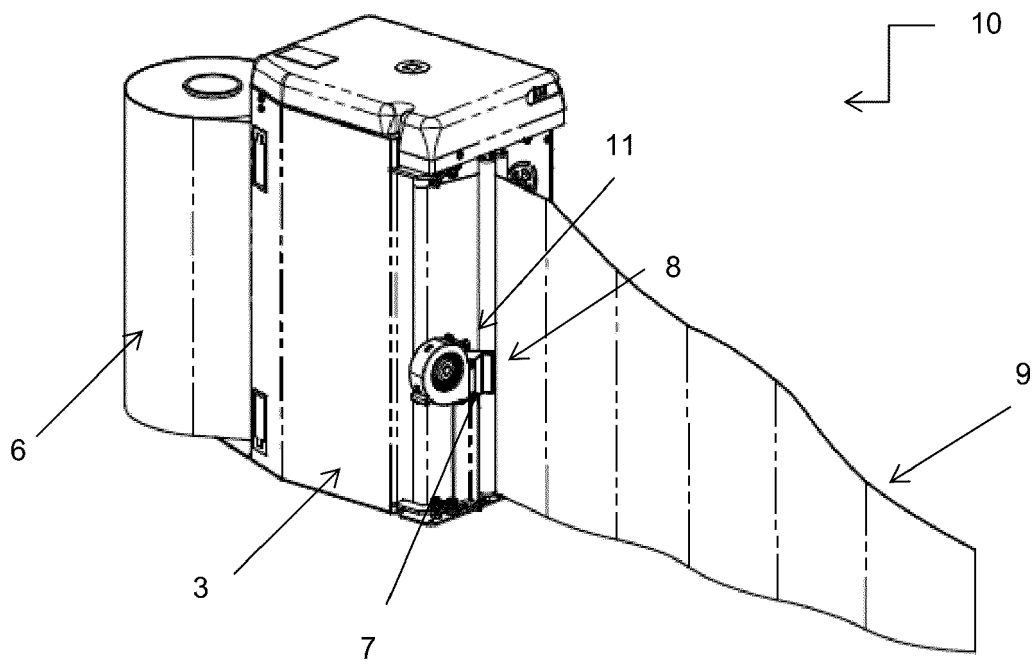


Figura 3

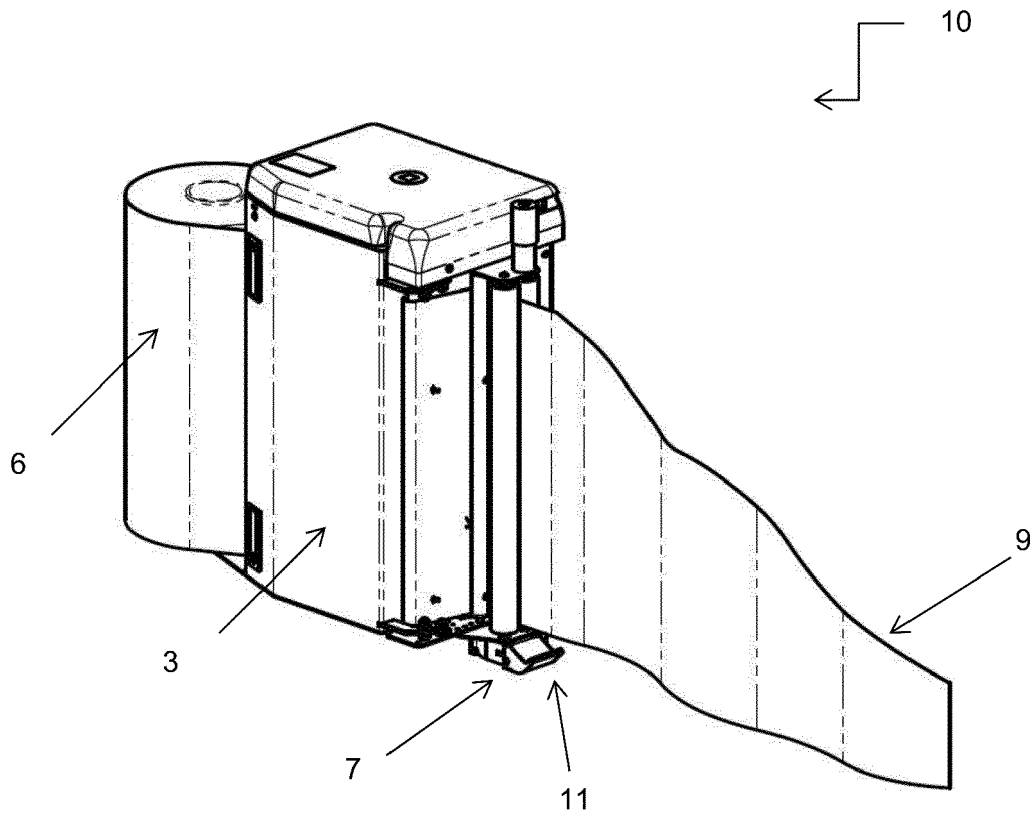


Figura 3b

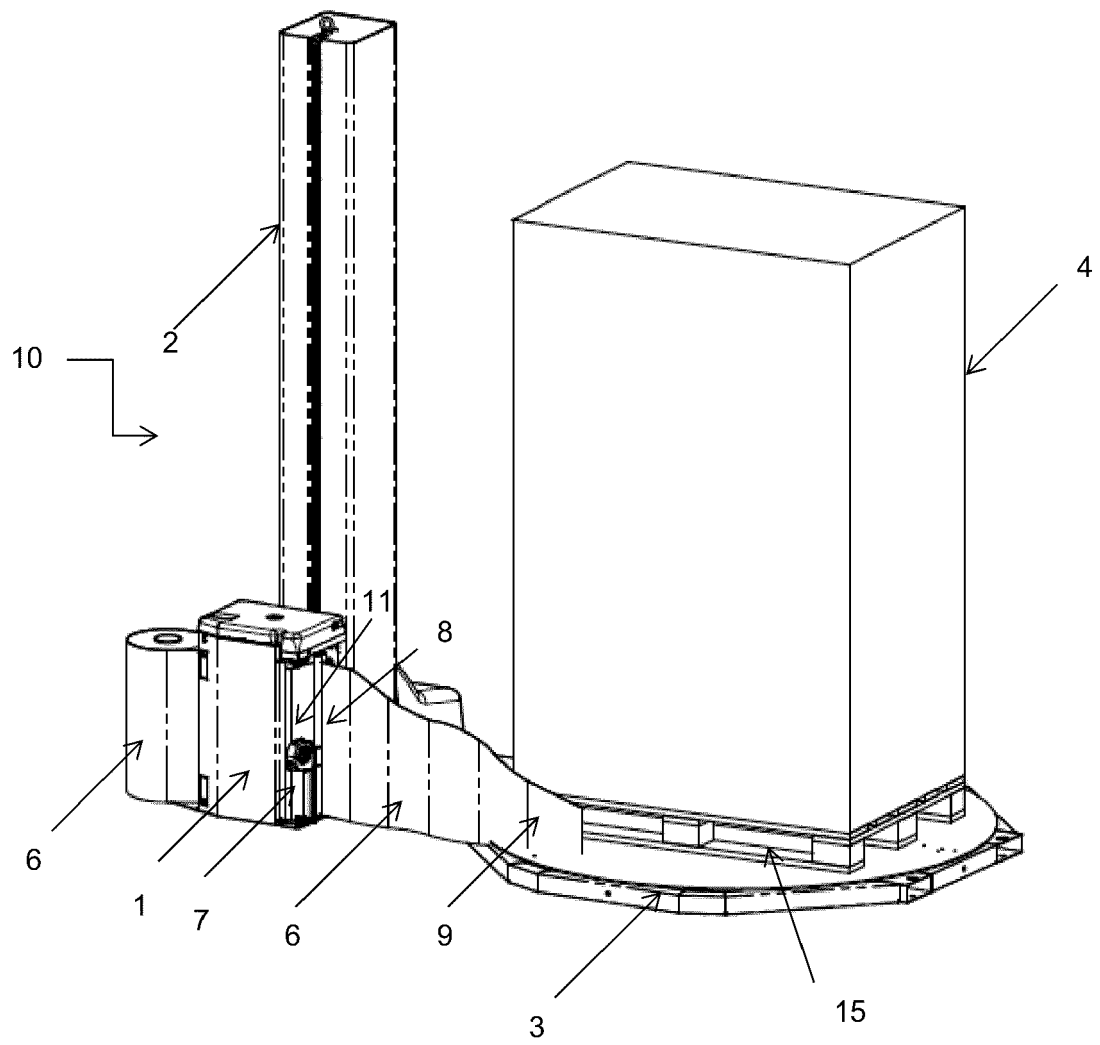


Figura 4a

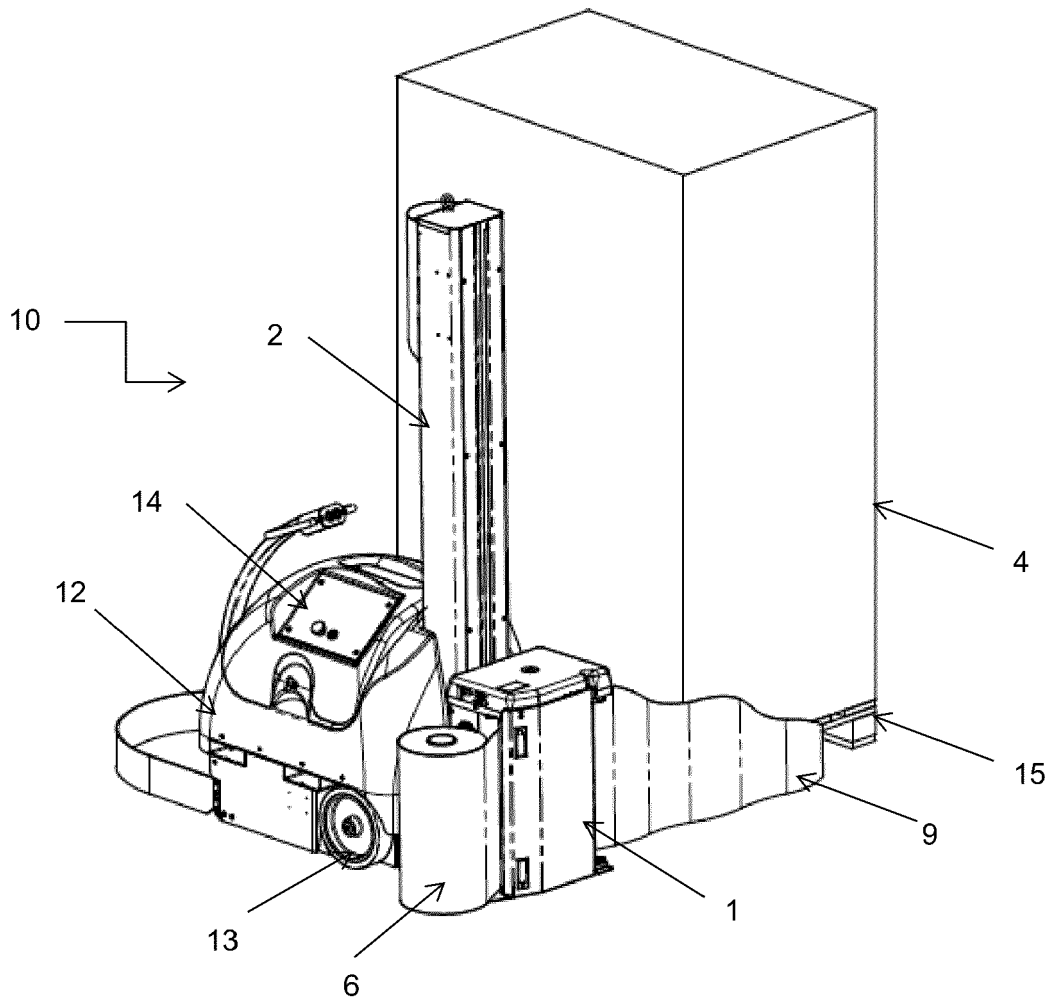
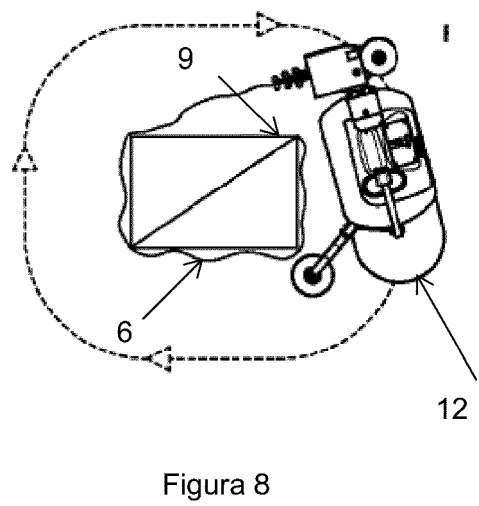
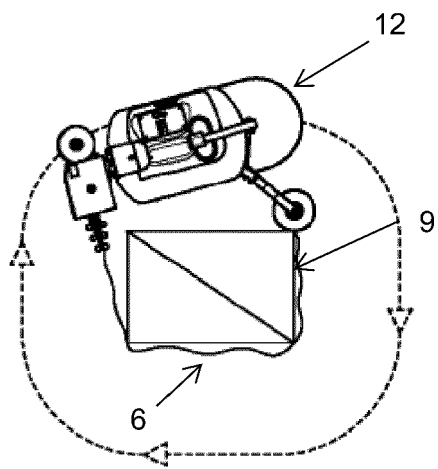
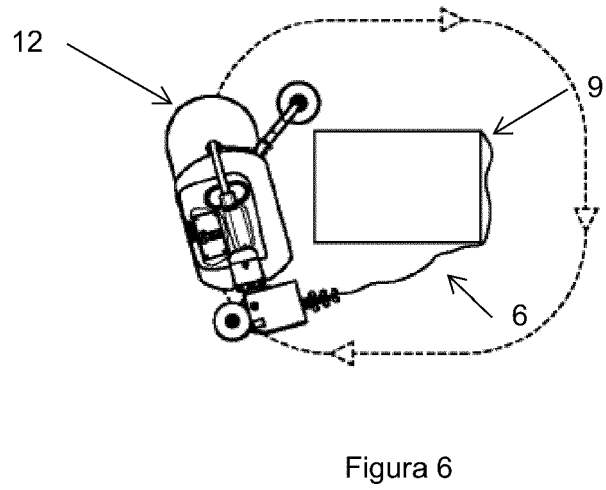
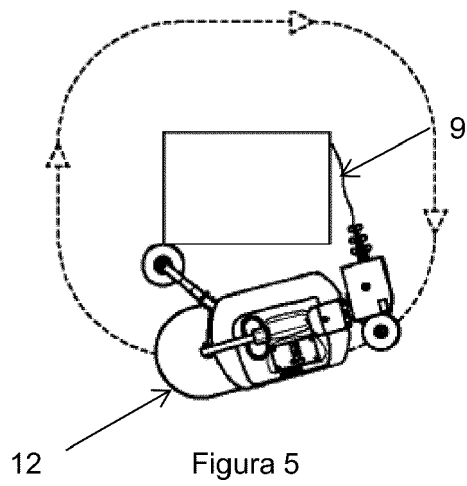


Figura 4b



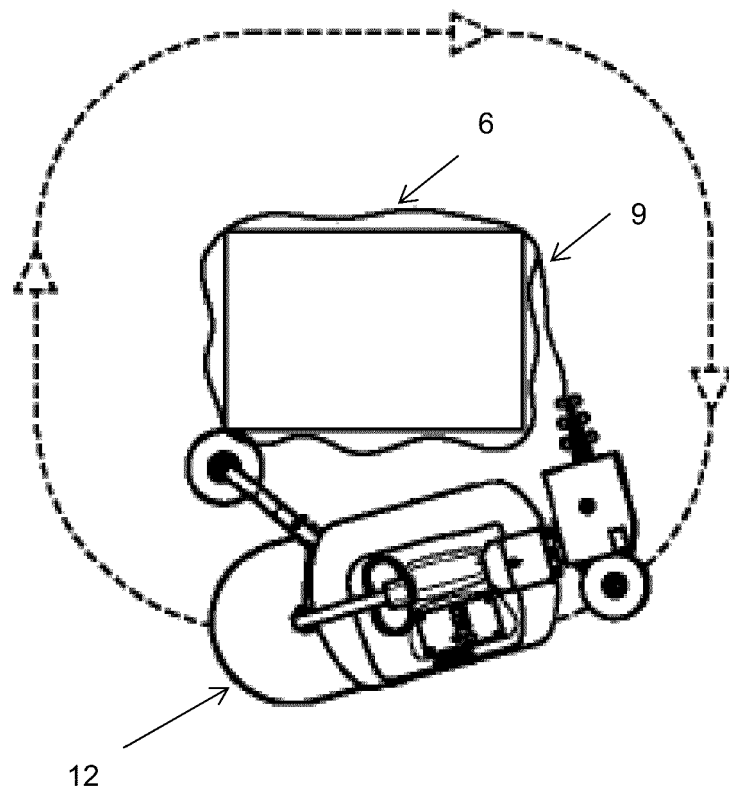


Figura 9



EUROPEAN SEARCH REPORT

Application Number
EP 21 18 5827

5

10

15

20

25

30

35

40

45

50

55

2

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2004/182050 A1 (PIERI DANICA [IT]) 23 September 2004 (2004-09-23) * Figures; 0017, 0027 *	1-10	INV. B65B11/02 B65B11/04
A	US 2010/037562 A1 (FORNI ANGELO [IT] ET AL) 18 February 2010 (2010-02-18) * Figures; 0017 *	1-10	
A	US 4 995 224 A (YOURGALITE RAY A [US] ET AL) 26 February 1991 (1991-02-26) * Figures *	1-10	
A	US 2001/015050 A1 (LANCASTER PATRICK R [US] ET AL) 23 August 2001 (2001-08-23) * Figures *	1-10	
A	FR 2 105 591 A5 (ODELBERG STIG) 28 April 1972 (1972-04-28) * Figures *	1-10	
			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 6 September 2021	Examiner Ngo Si Xuyen, G
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			

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

EP 21 18 5827

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-09-2021

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004182050 A1	23-09-2004	AT 367963 T EP 1426296 A1 US 2004182050 A1	15-08-2007 09-06-2004 23-09-2004
US 2010037562 A1	18-02-2010	AT 533697 T EP 2137073 A1 ES 2375243 T3 US 2010037562 A1 WO 2008114179 A1	15-12-2011 30-12-2009 28-02-2012 18-02-2010 25-09-2008
US 4995224 A	26-02-1991	NONE	
US 2001015050 A1	23-08-2001	AU 776039 B2 CA 2279835 A1 DE 69923392 T2 DE 69933711 T2 EP 0980830 A2 EP 1415914 A1 JP 4331343 B2 JP 2000062710 A US 6269610 B1 US 2001015050 A1 US 2003136082 A1 US 2005183390 A1	26-08-2004 20-02-2000 22-12-2005 23-08-2007 23-02-2000 06-05-2004 16-09-2009 29-02-2000 07-08-2001 23-08-2001 24-07-2003 25-08-2005
FR 2105591 A5	28-04-1972	NONE	