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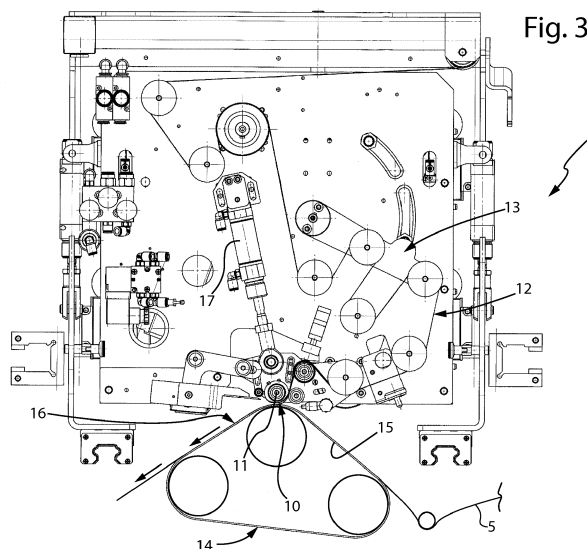
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(54) **DEVICE AND METHOD FOR APPLYING GRIPPING HANDLES ON PACKAGING FILMS**

(57) The present invention relates to a device and a method (1) for applying gripping handles (M) on packaging films (P), preferably heat shrinkable, that are being supplied on shrinkwrappers (2) for making bundles (F) of food containers (C). The device (1) comprises: an application head (10) provided with an application roller (11) for applying a plurality of handles (M) supplied in the form of a continuous web (12) and subsequently cut into portions, each handle (M) having adhesive ends (E) for engagement with the corresponding film (P); an abutment mechanism (14) for supporting a plurality of films (P) sup-

plied in the form of a continuous web (5) and subsequently cut into portions, the roller (11) of the head (10) and the abutment mechanism (14) being relatively movable between a non-operating condition, in which they are not engaged, and an operating condition, in which the roller (11) of the head (10) is arranged at the abutment mechanism (14), against one of the films (P) being supplied in order to apply on the latter a respective handle (M) being supplied. The roller (11) of the head (10) is motorized and is independently controllable with respect to the feeding of the films (P) being supplied.



Description

[0001] The present invention relates to an application device for applying gripping handles on packaging films, preferably heat shrinkable, that are being supplied on shrinkwrappers for making bundles of food containers, in particular cans, tins, bottles, flasks and/or the like.

[0002] The present invention also relates to an application method for applying gripping handles on packaging films, preferably heat shrinkable, that are being supplied on shrinkwrappers for making bundles of food containers and/or the like.

[0003] An object of the present invention is also a shrinkwrapper for making bundles of food containers, such as cans, tins, bottles, flasks and/or the like, provided with such device and adapted to carry out such method.

[0004] The present invention may be used in the industrial field of machines and devices for packaging cans, tins, bottles, flasks and/or the like, containers for products of any type, in particular food products.

[0005] As is known, packaging the aforementioned containers generally is performed by means of shrinkwrappers that group together and wrap, with appropriate heat-shrinkable packaging films supplied in the form of a continuous web, a predetermined number of containers. The wrapping of the aforementioned sets of containers causes the formation of the so-called bundles that facilitate the transport and/or storage thereof. Normally, the aforesaid bundles are provided with suitable gripping handles that may be applied to the packaging films both later and before the formation thereof.

[0006] In order to speed up the packaging methods, it is common practice to apply the gripping handles directly on the packaging films before applying the wrapping of the containers to be packaged.

[0007] The operation of applying the gripping handles to the packaging films normally is performed by means of respective application devices that are mounted on the shrinkwrappers. Such application devices usually comprise a movable application head that is provided with a respective idle application roller, that is to say free to rotate around its central axis without driving by any motor members, that operates directly in contact with the packaging films being supplied during the application of the gripping handles.

[0008] A plurality of gripping handles to be applied to the respective packaging films being supplied is suitably provided with the application roller, they too in the form of continuous web.

[0009] In order to provide the application roller with an adequate abutment surface during the fixing of the gripping handles on the packaging films, the application device provides a suitable abutment mechanism that adequately supports the packaging films being supplied.

[0010] In detail, the abutment mechanism opposes the pressure that the application roller exerts on the respective gripping handle and packaging film, thus allowing the adhesion of the adhesive ends of the gripping handle

under pressure and therefore, the application of the latter.

[0011] Although the current techniques for applying the gripping handles to the packaging films used to make the aforesaid bundles allow reasonable joining therebetween, the Applicant has noted that they are nonetheless not without certain drawbacks and may be improved under various aspects, mainly in relation to the gripping space or slot defined between the packaging film and the relative gripping portion of the gripping handle, once heat shrinking is complete.

[0012] In particular, the Applicant has noted that the known devices and methods for applying the gripping handles, such as shrinkwrappers that mount such devices and implement such methods, apply the gripping handles on the corresponding packaging films, causing the latter to move forward at the same feeding velocity as the packaging films. Thereby, each gripping handle applied develops longitudinally on the respective packaging film according to the same longitudinal measurement.

The gripping handle then is tensioned on the respective packaging film without having any loose area.

[0013] This application method allows obtaining gripping handles whose non-adhesive gripping portion touches the respective packaging film.

[0014] During the heat-shrinking step of the packaging films around the respective sets of containers to be packaged, the packaging film retracts, adhering as much as possible to the respective containers.

[0015] If the containers consist of bottles whose section narrows at the neck, the shrunk packaging film forms, between one bottle and the other, a wide concavity, while the gripping portion of the respective gripping handle substantially remains horizontally tensioned between the caps of such bottles. The concavity of the shrunk packaging film defines the gripping space or slot to be used to manually grip the bundle. Contrarily, if the containers to be packaged consist of cans, tins, bottles and/or flasks with a wide neck, or of box-like packages, the application of the gripping handles according to that disclosed above does not allow defining a sufficient gripping space or slot to allow adequately gripping the bundle because the space between the gripping handle and the packaging film is rather small.

[0016] It is the main object of the present invention to propose a device and a method for applying gripping handles on packaging films, preferably heat shrinkable, being supplied on shrinkwrappers for making bundles of containers, in particular cans, tins, bottles and/or the like, and also a shrinkwrapper provided with such application device and/or adapted to carry out such method, capable of resolving the problems encountered in the known technique.

[0017] The above-specified object substantially is achieved by a device and a method for applying gripping handles on packaging films, preferably heat shrinkable, being supplied on shrinkwrappers for making bundles of containers, such as cans, tins, bottles and/or the like, and also a shrinkwrapper provided with such application de-

vice and/or adapted to carry out such method, as expressed and described in the following claims.

[0018] There is now provided, by way of example, the description of a preferred but not exclusive embodiment of a device and a method for applying gripping handles on packaging films, preferably heat shrinkable, being supplied on shrinkwrappers for making bundles of containers, such as cans, tins, bottles and/or the like, and also of a shrinkwrapper provided with such application device and/or adapted to carry out such method, according to the present invention.

[0019] The description will be made hereinbelow with reference to the accompanying drawings, provided for indicative purposes only and therefore not limiting, wherein:

figure 1 is a general perspective view of a shrinkwrapper on which there is mounted an application device for gripping handles on packaging films, according to the present invention;

figure 2 is an elevation view of the shrinkwrapper of figure 1;

figure 3 is a front schematic view of the application device mounted on the shrinkwrapper of figures 1 and 2;

figure 4 is a rear schematic view of the application device of figure 3;

figure 5 is a front elevation view of a bundle of containers that can be obtained by means of the device and the application method, and also the shrinkwrapper, according to the present invention;

figure 6 is a side elevation view of the bundle of figure 5.

[0020] With reference to figures 1 to 4, number 1 indicates an application device as a whole, for gripping handles M on packaging films P being supplied on respective shrinkwrappers 2 to make bundles of food containers C, in particular cans, tins, bottles, flasks and/or the like, according to the present invention.

[0021] As is shown in figures 1 and 2, the application device 1 is mounted on a shrinkwrapper 2 for making and packaging bundles F (figures 5 and 6) of food containers C, such as for example cans, tins, bottles, flasks and/or the like, according to the present invention.

[0022] The shrinkwrapper 2 comprises a supplying station 3 provided with one or more reels 4 for supplying a continuous web 5 (figure 3) preferably made of heat-shrinkable plastic material, on which there is provided a series of packaging films P, each intended to form a respective bundle F.

[0023] A joining station 6 is provided close to and downstream of the supplying station 3, in which there is operatively arranged the above-mentioned application device 1 of the gripping handles M to the packaging films P being supplied.

[0024] A carrier station 7, that sends the continuous web 5 and by consequent the packaging films P made

therefrom by means of corresponding cutting operations, provided with the respective gripping handles M, towards a coupling station 8 preferably arranged on a different level, is operatively provided close to the joining station 6 and downstream thereof.

[0025] At the coupling station 8, each packaging film P, previously cut from the continuous web 5 in the carrier station 7, is wound around a respective set of containers C that come from a respective supplying station 9.

[0026] There is provided, close to the coupling station 8 and downstream thereof, a heating station (not depicted in the accompanying drawings) at which each packaging film P, previously wound around a respective set of containers C, is heated to be deformed and shrunk on the containers C themselves, thus forming the respective bundle F.

[0027] The bundles F outlet from the heating station are conveyed (by known means not depicted) towards an accumulation and storage station (it also not illustrated).

[0028] As is shown in figures 3 and 4, the application device 1 of the joining station 6 described above comprises at least one application head 10 provided with at least one application roller 11 of a plurality of gripping handles M, supplied in the form of a continuous web 12 by means of a series of return elements 13 and similar drive mechanisms operatively associated with the application head 10.

[0029] Again with reference to figures 3 and 4, the application device 1 of the joining station 6 comprises at least one abutment mechanism 14 for operatively supporting the packaging films P supplied in the form of a continuous web 5 in the above-described shrinkwrapper 2.

[0030] The application roller 11 of the application head 10 and the abutment mechanism 14 are relatively movable between a non-operating condition, in which they are spaced apart and the packaging films P being supplied move forward on the abutment mechanism 14, and an operating condition (figure 3), in which the application roller 11 is arranged at the abutment mechanism 14, against a respective packaging film P in order to apply on the latter a respective gripping handle M of the continuous web 12.

[0031] In detail, the application roller 11 of the application head 10 is movable away from and towards, between the non-operating condition and the operating condition, to apply a respective gripping handle M on each packaging film P being supplied.

[0032] Advantageously, the abutment mechanism 14 comprises at least a support web 15, preferably of greater width than the width of the packaging films being supplied, having a feeding surface 16 that at least partially faces the application head 10 for feeding the packaging films P being supplied on the shrinkwrapper 2.

[0033] The feeding surface 16 of the support web 15 provides an abutment for the application roller 11 of the application head 10, in the operating condition. By direct-

ly acting against the feeding surface 16 of the support web 15, the application roller 11 is capable of applying a respective gripping handle M on each packaging film P being supplied.

[0034] In detail, during the application of each gripping handle M on the respective packaging film P, suitable adhesive ends E of the same ensure the permanent engagement thereof.

[0035] With particular reference to the application roller 11 of the application head 10, the application roller 11 advantageously is motorized and is independently controllable with respect to the feeding of the packaging films P being supplied and supported by the abutment mechanism 14 between the latter and the application roller itself.

[0036] As shown in figure 4, the application head 10 comprises at least a motor 11a or a similar actuator operatively connected to the application roller 11 for controlling the angular velocity w of the latter and modifying such angular velocity w according to a preset program.

[0037] Again with reference to figure 4, the motor 11a or the similar actuator is operatively connected to the application roller 11 by means of at least two driving pulleys 11b and at least one moving belt 11c which partially surrounds such driving pulleys 11b. Alternatively, it is also possible to provide that the motor 11a or the similar actuator is directly connected to the application roller 11 without interposing intermediate driving members.

[0038] Preferably, the motor 11a or the similar actuator is of the electric type. However, motors and similar actuators of the pneumatic type are not excluded and may be used.

[0039] Advantageously, the motor 11a or the similar actuator comprises a servo-motor or a three-phase motor or a brushless motor.

[0040] According to a preferred aspect of the present invention, the application device 1 advantageously is provided with a control unit (not depicted in the accompanying figures), preferably electronic and programmable, operatively connected to the motor 11a or similar actuator to rotationally actuate the application roller 11.

[0041] The control unit is arranged and programmed for modifying, for each packaging film P being supplied, the angular velocity w of the application roller 11 so as to determine, for at least a settable and programmable time interval T, a feeding of the gripping handle M being supplied that is faster than the feeding of the respective packaging film P being supplied.

[0042] In greater detail again, the control unit is arranged for:

- allowing the application roller 11 to rotate or rotate the latter at a common angular feeding velocity w, wherein each gripping handle M being supplied moves forward at substantially the same feeding velocity VaP of the respective packaging film P being supplied and supported by the abutment mechanism 14;

- decreasing the contact force between the gripping handle M and the packaging film P, for example by reducing the pressure in the cylinder 17 (figure 3);
- increasing the angular velocity w of the application roller 11 up to a preset limit in such a way as to increase the feeding velocity VaM of each gripping handle M with respect to the feeding velocity VaP of the corresponding packaging film P so that the respective gripping handle M, moving forward faster with respect to the corresponding packaging film P, defines, among the latter, a respective loop A (figure 5) that is useful for manually gripping the bundle F being formed;
- reducing the angular velocity w of the application roller 11 or allowing the natural reduction of such angular velocity w so as to reduce the feeding velocity VaM of each gripping handle M at least until achieving the feeding velocity VaP of the packaging film P;
- increasing the contact force between the gripping handle M and the packaging film P, for example by increasing the pressure in the cylinder 17 (figure 3), so as to ensure proper adhesion of the adhesive end E of the gripping handle M on the packaging film P.

[0043] The present invention also relates to an application method for gripping handles M on packaging films P in the form of a continuous web 5 being supplied on a shrinkwrapper 2.

[0044] The method first comprises providing the aforesaid application head 10, then providing the abutment mechanism 14, which is to be operatively placed at the application head 10 to support the packaging films P being supplied during feeding.

[0045] The gripping handles M are supplied to the application head 10, while the packaging films P are guided towards the abutment mechanism 14.

[0046] The packaging films P move forward between the application head and the abutment mechanism 14, at the application head 10.

[0047] When each packaging film P is at the application head 10, a respective gripping handle M, provided with corresponding adhesive joining ends E, is applied thereon by means of a pressure exerted by the application head 10 by means of a corresponding application roller 11.

[0048] The packaging films P are supported by the support mechanism along the whole path travelled by the continuous web 5 at the application head 10. Advantageously, the feeding surface 16 of the continuous web 15 defines an abutment that interacts with the application roller 11 of the application head 10 to ensure the optimal engagement of the adhesive joining ends E of the gripping handles M being applied to the respective packaging films P.

[0049] During the whole application method, the support web 15 is actuated to move according to the same feeding direction as the packaging films P being supplied to drag and/or accompany the latter through the applica-

tion head 10.

[0050] The application of each gripping handle M, in particular of the adhesive joining ends E of the latter, on the respective packaging film P during feeding preferably is performed by controlling the application roller 11 of the application head 10 independently with respect to the feeding of the packaging film P being supplied and supported by the abutment mechanism between the latter and the application roller 11 itself.

[0051] In detail, the application of each gripping handle M on the respective packaging film P is carried out by controlling the angular velocity w of the application roller 11 and modifying the same according to a preset program.

[0052] In greater detail again, modifying the angular velocity w of the application roller 11 for each packaging film P being supplied is performed by increasing the angular velocity w of the application roller 11 and thus causing, for at least a settable and programmable time interval T, a feeding of the gripping handle M being supplied that is faster than the feeding of the respective packaging film P being supplied.

[0053] In even greater detail again, the step of modifying the angular velocity w of the application roller 11 is performed for each packaging film P being supplied according to the following steps:

- allowing the application roller 11 to rotate or rotate the latter at a common angular feeding velocity w, wherein each gripping handle M being supplied moves forward at substantially the same feeding velocity VaP of the respective packaging film P being supplied and supported by the abutment mechanism 14, whereby one of the adhesive ends E adheres to the respective packaging film P being supplied;
- decreasing the contact force between the gripping handle M and the packaging film P;
- increasing the angular velocity w of the application roller 11 up to a preset limit in such a way as to increase the feeding velocity VaM of each gripping handle M with respect to the feeding velocity VaP of the corresponding packaging film P so as to define a respective loop A between the latter;
- reducing the angular velocity w of the application roller 11 or allowing the natural reduction of such angular velocity w so as to reduce the feeding velocity VaM of each gripping handle M at least until achieving the feeding velocity VaP of the packaging film P;
- increasing the contact force between the gripping handle M and the packaging film P so as to ensure proper adhesion of the adhesive end E of the gripping handle M on the respective packaging film P.

[0054] The application device and the method described above, like the above-mentioned shrinkwrapper 2, resolve the problems encountered in the known technique and achieve important advantages.

[0055] In particular, the presence of the application roller

er which angular velocity is variable and controllable in relation to contingent needs allows, for a settable time interval, an increased feeding of the gripping handle with respect to the one of the respective packaging film, thus accordingly defining between the latter a space sufficient to insert the fingers and/or the hand of a consumer.

[0056] It is also worth noting that the provision of the application roller to modify its angular velocity in light of the commands it is imparted with not only allows making loops suitable for manual gripping on the bundles being produced, but it allows to make wider or narrower loops according to the type of bundle to be made, and also to the contingent needs.

Claims

1. Application device (1) for applying gripping handles (M) on packaging films (P), preferably heat shrinkable, that are being supplied on shrinkwrappers (2) for making bundles (F) of food containers (C), in particular cans, tins, bottles, flasks and/or the like, the application device (1) comprising:

at least one application head (10) provided with at least one application roller (11) for applying a plurality of gripping handles (M) supplied in the form of a continuous web (12) and subsequently cut into portions, each gripping handle (M) having adhesive ends (E) for engagement with the corresponding packaging film (P), the application head (10) comprising at least a motor (11a) or a similar actuator operatively connected to the application roller (11) for controlling the angular velocity (w) of the latter and modifying the same according to a preset program;

at least one abutment mechanism (14) for operatively supporting a plurality of packaging films (P) supplied in the form of a continuous web (5) and subsequently cut into portions, the application roller (11) of the application head (10) and the abutment mechanism (14) being relatively movable between a non-operating condition, in which they are not engaged, and an operating condition, in which the application roller (11) of the application head (10) is arranged at the abutment mechanism (14), against at least one of the packaging films (P) being supplied in order to apply on the latter a respective gripping handle (M) being supplied, the application roller (11) of the application head being motorized and being independently controllable with respect to the feeding of the packaging films (P) being supplied, supported by the abutment mechanism (14) between the latter and the application roller (11) itself,

characterized in that it further comprises at least one control unit, preferably electronic and

- programmable, which is operatively connected to the motor (11a) or the similar actuator for rotationally actuating the application roller (11), the control unit modifying, for each packaging film (P) being supplied, the angular velocity (w) of the application roller (11) so as to determine, for at least a settable and programmable time interval (T), a feeding of the gripping handle (M) being supplied that is faster than the feeding of the respective packaging film (P) being supplied.
2. Device (1) according to claim 1, wherein the motor (11a) or the similar actuator is operatively connected to the application roller (11) by means of at least two driving pulleys (11b) and at least one moving belt (11c) which partially surrounds such driving pulleys (11b).
 3. Device (1) according to claim 1 or 2, wherein the motor (11a) or the similar actuator is directly connected to the application roller (11) without interposing intermediate driving members.
 4. Device (1) according to any one of the preceding claims, wherein the motor (11a) or the similar actuator is of the electric or pneumatic type.
 5. Device (1) according to any one of the preceding claims, wherein the motor (11a) or the similar actuator comprises a servo-motor or a three-phase motor or a brushless motor.
 6. Device (1) according to claim 1, wherein the control unit is arranged for:
 - allowing the application roller (11) to rotate or to rotate the latter at a common angular feeding velocity (w), wherein each gripping handle (M) being supplied moves forward at substantially the same feeding velocity (VaP) of the respective packaging film (P) being supplied and supported by the abutment mechanism (14);
 - decreasing the contact force between the gripping handle (M) and the packaging film (P);
 - increasing the angular velocity (w) of the application roller (11) up to a preset limit in such a way as to increase the feeding velocity (VaM) of each gripping handle (M) with respect to the feeding velocity (VaP) of the corresponding packaging film (P), the increase of the feeding velocity (VaM) of each gripping handle (M) with respect to the feeding velocity (VaP) of the respective packaging film (P) defining a respective loop (A) between the latter;
 - reducing the angular velocity (w) of the application roller (11) or allowing the natural reduction of such angular velocity (w) so as to reduce the

feeding velocity (VaM) of each gripping handle (M) at least until achieving the feeding velocity (VaP) of the packaging film (P);
increasing the contact force between the gripping handle (M) and the packaging film (P).

7. Method for applying gripping handles (M) on packaging films (P), preferably heat shrinkable, that are being supplied on shrinkwrappers (2) for making bundles (F) of containers (C), in particular cans, tins, bottles, flasks and/or the like, the method comprising the steps of:

providing at least an application head (10) for a plurality of gripping handles (M) supplied in the form of a continuous web (12) and subsequently cut into portions, each gripping handle (M) having adhesive ends (E) for engagement with the corresponding packaging film (P);
providing at least an abutment mechanism (14), at the application head (10) for supporting, during feeding, a plurality of packaging films (P) in the form of a continuous web (5) subsequently cut into portions;
supplying the gripping handles (M) to the application head (10);
guiding the packaging films (P) toward the abutment mechanism (14), the packaging films (P) moving forward between the latter and the application head (10) at a predetermined feeding velocity (VaP);
applying a gripping handle (M) to each packaging film (P) by pressing the application head (10) on the latter against the abutment mechanism (14), at least one adhesive end (E) of the gripping handle (M) adhering to the respective packaging film (P) to ensure the union between the latter,
controlling the application roller (11) of the application head (10) independently with respect to the feeding of the packaging film being supplied, supported by the abutment mechanism (14) between the latter and the application roller (11), controlling the angular velocity (w) of the application roller (11) and modifying the same according to a preset program,
characterized in that:

modifying the angular velocity (w) of the application roller (11) is performed for each packaging film (P) being supplied;
modifying the angular velocity (w) of the application roller (11) for each packaging film (P) being supplied is performed by increasing the angular velocity (w) of the application roller (11) and determining, for at least a settable and programmable time interval (T), a feeding of the gripping handle (M) being

supplied that is faster than the feeding of the respective packaging film (P) being supplied.

8. Method according to claim 7, wherein the step of modifying the angular velocity (w) of the application roller (11) is performed for each packaging film (P) being supplied according to the following steps:

allowing the application roller (11) to rotate or to rotate the latter at a common angular feeding velocity (w), wherein each gripping handle (M) being supplied moves forward at substantially the same feeding velocity (VaP) of the respective packaging film (P) being supplied and supported by the abutment mechanism (14), one of the adhesive ends (E) of the gripping handle (M) adhering to the respective packaging film (P) being supplied;

decreasing the contact force between the gripping handle (M) and the packaging film (P);

increasing the angular velocity (w) of the application roller (11) up to a preset limit in such a way as to increase the feeding velocity (VaM) of each gripping handle (M) with respect to the feeding velocity (VaP) of the corresponding packaging film (P), the increase of the feeding velocity (VaM) of each gripping handle (M) with respect to the feeding velocity (VaP) of the respective packaging film (P) defining a respective loop (A) between the latter;

reducing the angular velocity (w) of the application roller (11) or allowing the natural reduction of such angular velocity (w) so as to reduce the feeding velocity (VaM) of each gripping handle (M) at least until achieving the feeding velocity (VaP) of the packaging film (P);

increasing the contact force between the gripping handle (M) and the packaging film (P) so as to ensure proper adhesion of the adhesive end E of the gripping handle M on the respective packaging film P.

9. Shrinkwrapper (2) for making bundles (F) of food containers (C) such as cans, tins, bottles, flasks and/or the like, comprising:

at least one supplying station (3) for supplying a plurality of packaging films (P), preferably made of heat-shrinkable material, in the form of a continuous web (5) cut into portions;

at least one joining station (6) operatively arranged downstream of the supplying station (3) for applying at least one gripping handle (M), supplied in the form of a continuous web (12), on a corresponding packaging film (P);

at least one coupling station (8) operatively arranged downstream of the joining station (6) for

wrapping each packaging film (P) provided with a respective gripping handle (M) around a predetermined set of containers (C) coming from a respective supplying station (9);

at least one heating station operatively arranged downstream of said coupling station (8) for heating each packaging film (P) and determining the shrinkage thereof around the corresponding containers (C),

characterized in that it comprises, at the joining station (6), at least one application device (1), according to any one of claims 1 to 6.

10. Shrinkwrapper (2) for making bundles (F) of food containers (C) such as cans, tins, bottles, flasks and/or the like, comprising:

at least one supplying station (3) for supplying a plurality of packaging films (P), preferably made of heat-shrinkable material, in the form of a continuous web (5) cut into portions;

at least one joining station (6) operatively arranged downstream of the supplying station (3) for applying at least one gripping handle (M), supplied in the form of a continuous web (12), on a corresponding packaging film (P);

at least one coupling station (8) operatively arranged downstream of the joining station (6) for wrapping each packaging film (P) provided with a respective gripping handle (M) on a predetermined set of containers (C) coming from a respective supplying station (9);

at least one heating station operatively arranged downstream of said coupling station (8) for heating each packaging film (P) and determining the shrinkage thereof around the corresponding containers (C),

characterized by implementing an application method for the gripping handles (M) to the respective packaging films (P) according to claim 7 or 8.

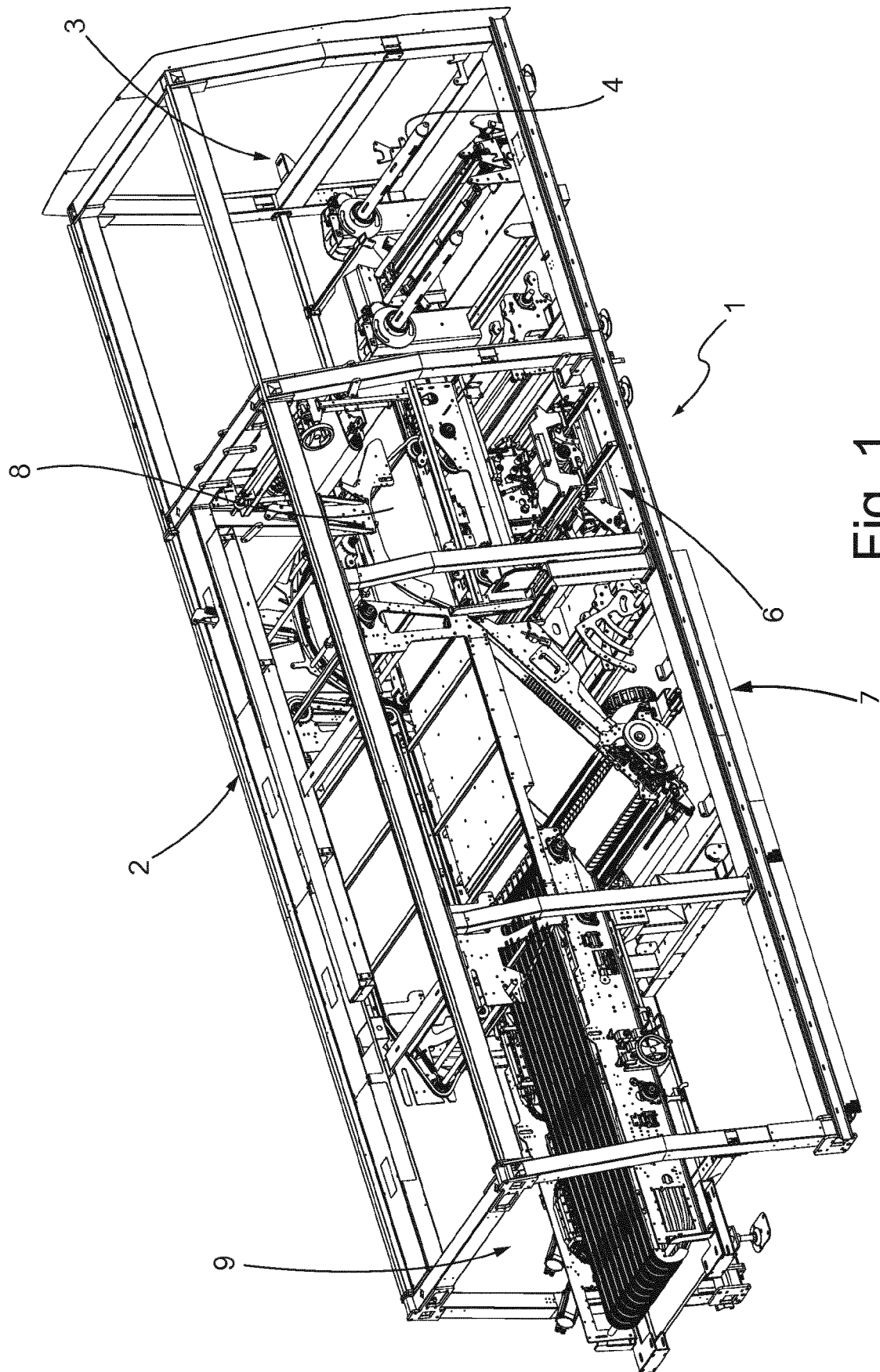


Fig. 1

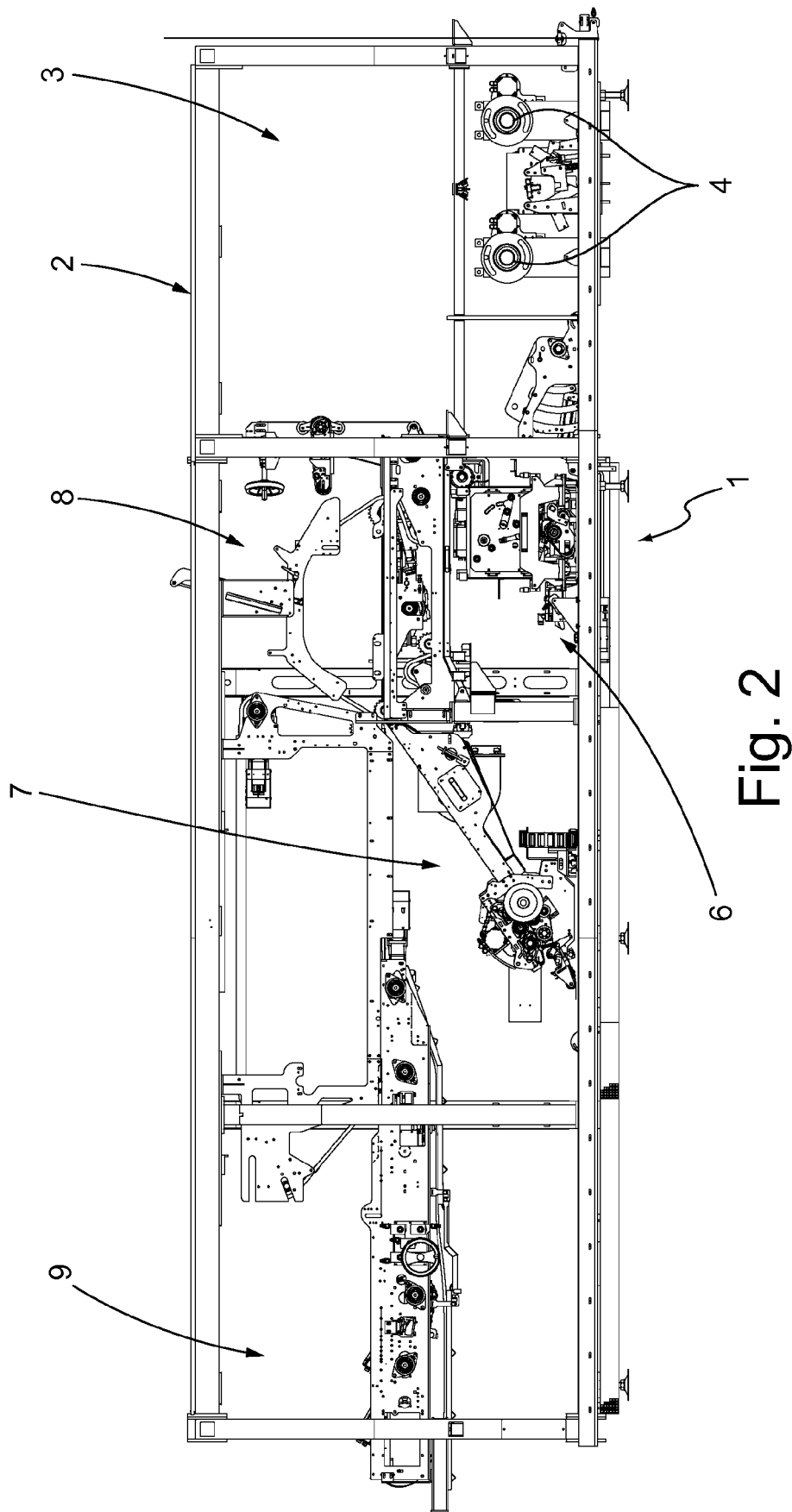


Fig. 2

Fig. 3

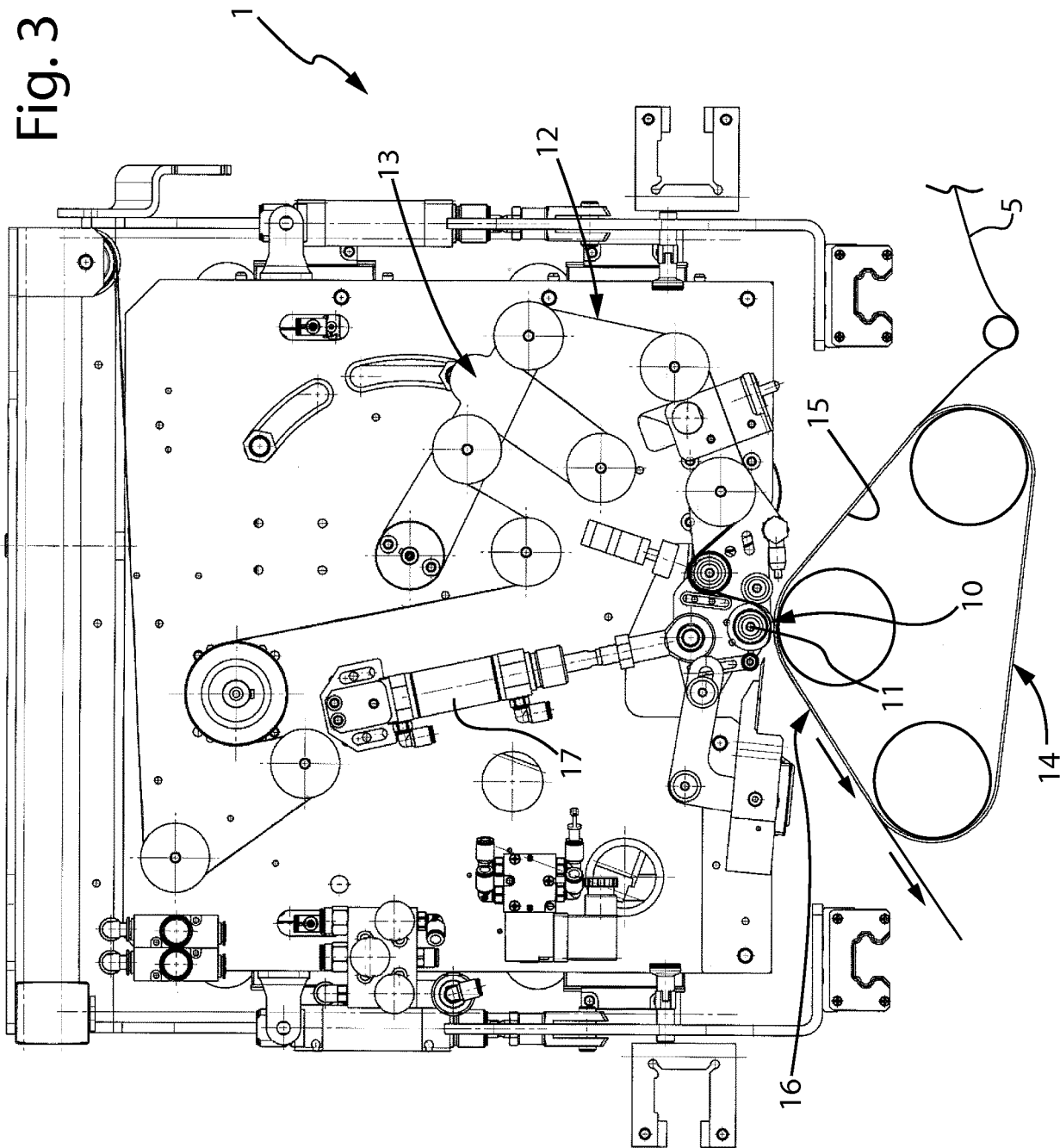


Fig. 4

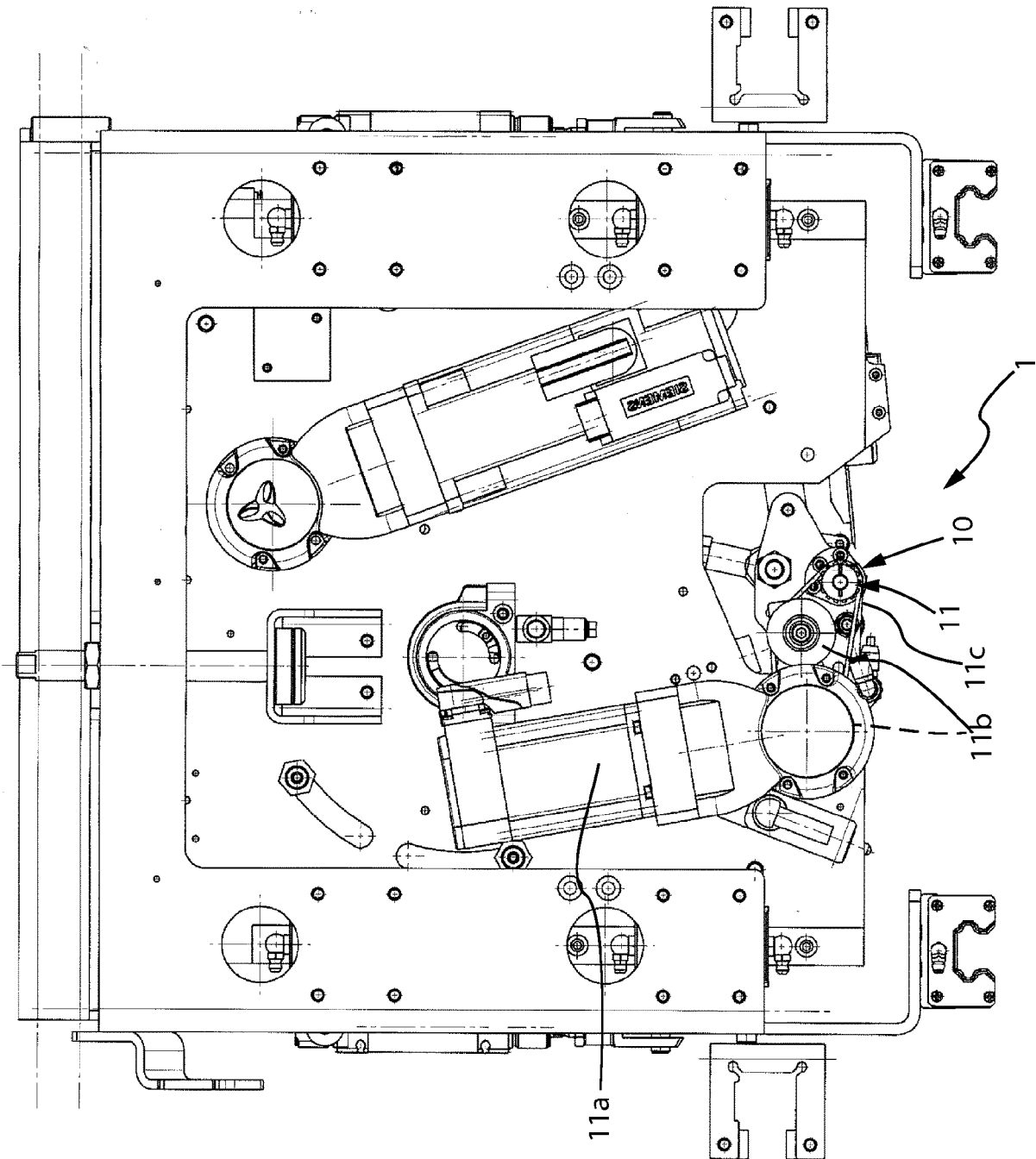


Fig. 5

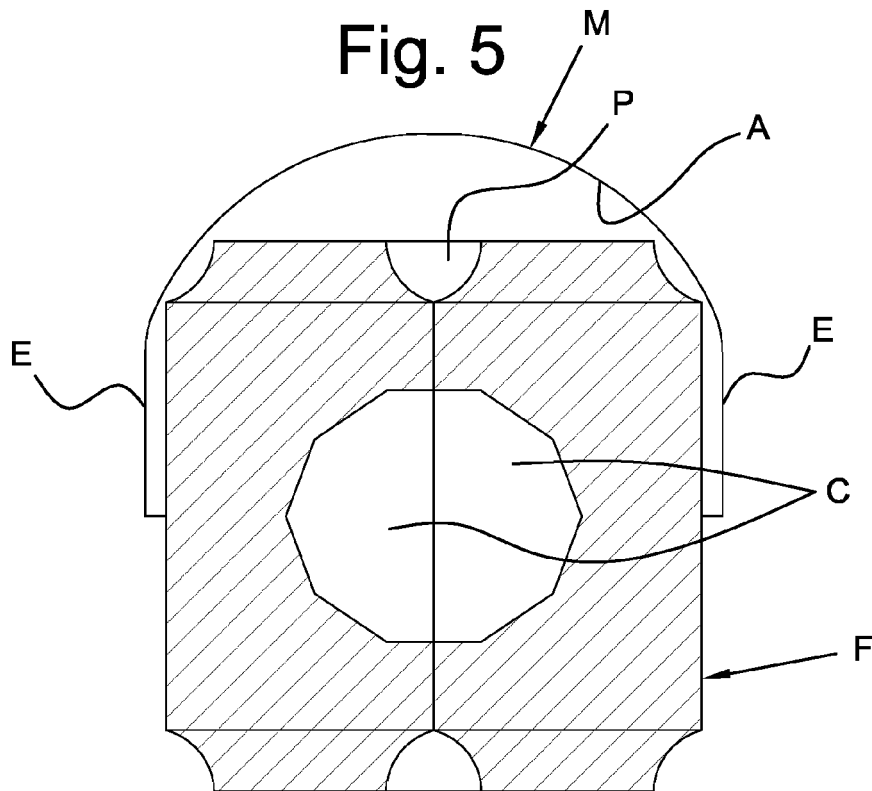
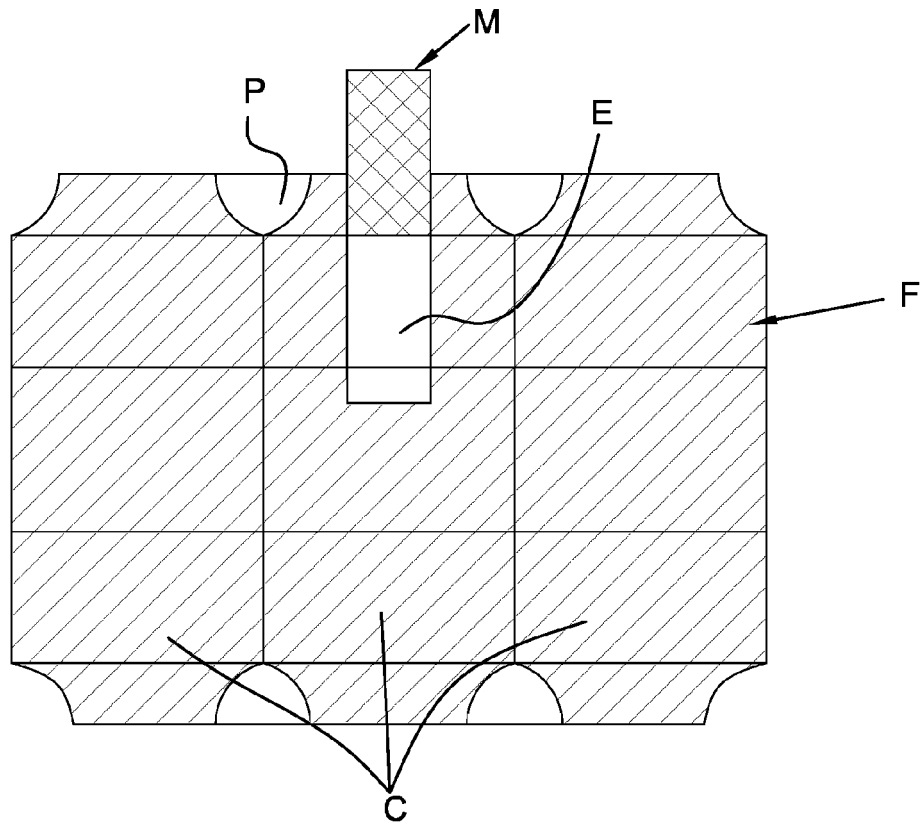


Fig. 6





EUROPEAN SEARCH REPORT

Application Number
EP 18 19 3208

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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)
A	WO 2015/036980 A1 (OCME SRL [IT]) 19 March 2015 (2015-03-19) * claims 1-14; figures 1-6d *	1-10	INV. B65B61/14
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