

(19)



(11)

EP 3 395 700 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
31.10.2018 Bulletin 2018/44

(51) Int Cl.:
B65B 53/06 (2006.01) **B65B 59/04** (2006.01)
B65B 9/02 (2006.01)

(21) Application number: **18000340.2**

(22) Date of filing: **10.04.2018**

(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

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(30) Priority: **28.04.2017 IT 201700046345**

(54) **PACKAGING SYSTEM**

(57) A packaging system (10) is described, comprising a supporting and containing structure (3) adapted to contain therein and to support: a film bending assembly (4); a welding bars assembly (8); a shrinkage assembly (5); first and second transporting means (7, 18) transverse to the advancement direction of the product in the

system (10) and adapted to receive the packaged parcel exiting from the shrinkage assembly (5) and from the supporting and containing structure (3) and to advance it towards third transporting means (19) transverse to the advancement direction of the product in the second transporting means (18).

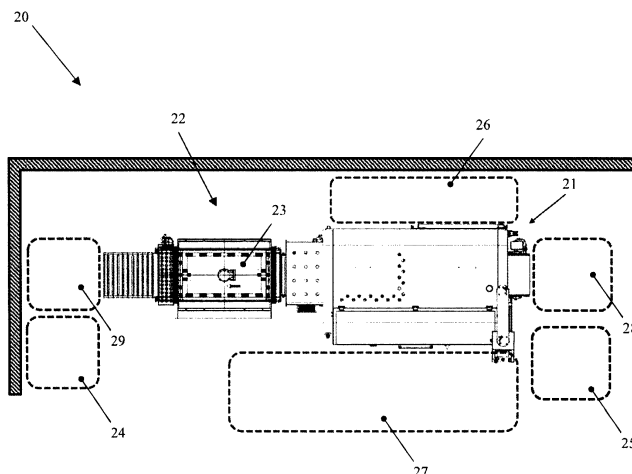


FIG. 1

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Description

[0001] The present invention refers to a packaging system, in particular to a packaging system of products in a plastic film, equipped with a welding bars assembly and with a shrinkage assembly.

[0002] In the art, there are packaging machines for products inside a plastic film, equipped with a "L"-shaped frame and with bars for welding and cutting the films, transverse and longitudinal with respect to the supply direction of the plastic film, adapted to perform welding and cutting of plastic films around a product to be packaged.

[0003] Moreover, there are packaging machines of products comprising a shrinkage tunnel inside which a heat-shrinkage oven is arranged, through which a product wound in a plastic case passes through a belt sliding inside the oven itself, in which heat-shrinkage and sealing of such case around the product are performed.

[0004] These packaging machines can both be used in a packaging line, in which it is necessary to provide around them areas which are free and accessible for storing the products to be packaged and the packaged products, to change the film coils, to change the format and to allow performing the ordinary maintenance.

[0005] In this use, these known packaging machines have the problem of requiring a wide space for their installation.

[0006] Another problem is that, for their operation, they require the use of two operators, with related working areas.

[0007] Object of the present invention is solving the above prior art problems, by providing a packaging system which has small overall sizes, and which requires, for its operation, the presence of a single operator.

[0008] The above and other objects and advantages of the invention, as will appear from the following description, are obtained with a packaging system as claimed in the independent claims. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0009] It is intended that the enclosed claims are an integral part of the present description.

[0010] It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as appears in the enclosed claims.

[0011] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a schematic view of a line of packaging machines for products according to the prior art;
- Figure 2 is a schematic view of a packaging system according to the present invention;

- Figure 3 is a side view of a packaging system according to the present invention; and
- Figure 4 is a perspective view of a packaging system according to the present invention.

[0012] With reference to Figure 1, a standard packaging line 20 is shown, comprising a first, known products packaging machine 21 equipped with bars for welding and cutting the films and a second packaging machine 22, also of a known type, comprising a shrinkage tunnel 23 for packaging a product through a heat-shrinking film, the two machines being installed in line; the packaging line 20 further comprises conveyor belts, also in line, for passing the products from the first machine 21 equipped with welding and cutting bars to the second machine 22 comprising the shrinkage tunnel 23 and for unloading the packaged products.

[0013] The known packaging line 20 further requires that free areas are provided around the machines, in particular an area 24 for storing packaged products, an area 25 for storing products to be packaged, an accessible area 26 for changing the film coil and to allow performing the ordinary maintenance, an accessible area 27 for changing the format and to allow performing the ordinary maintenance, a working area 28 for an operator responsible for entering the product into the first machine 21, and a working area 29 for an operator responsible for unloading the product from the second machine 22, the two working areas 28, 29 being provided at the two ends of the packaging line 20.

[0014] With reference to Figures 2 to 4, preferred embodiments of the packaging system according to the present invention are shown and described.

[0015] The packaging system 10 of the invention comprises a supporting and containing structure 3 adapted to contain therein and to support all components of the system 10 itself, among which the packaging system 10 comprises:

- a film bending assembly 4 comprising a bending area 6 in which a product to be packaged is inserted in a plastic film, for example single-bent, and advanced through first transporting means 7 to arrive in a following welding bars assembly 8; preferably, the plastic film of a known type, for example a heat-shrinking PP, PPLP or PVC film, is wound in a coil contained in the packaging system 10, for example on a support associated with the welding bars assembly 8 or with the film bending assembly 4;
- the welding bars assembly 8 of the known type, comprising bars for welding and cutting the films, for example transverse and longitudinal with respect to the supply direction of the plastic film, adapted to perform welding and cutting of the plastic film along transverse and longitudinal cutting lines, to make a case around the product to be packaged; at the end of the welding and cutting operations for the plastic film, the product enclosed in the case is advanced

through the first transporting means 7 to arrive in a following shrinkage assembly 5, and the film to be discarded is wound on a winder of a known type, preferably contained in the welding bars assembly 8;

- a shrinkage assembly 5 possibly supplied through the first transporting means 7 in which heat-shrinkage and sealing of the case around the product are performed, ending the packaging of the product; preferably the shrinkage assembly 5 comprises a shrinkage tunnel of a known type comprising an inlet opening for the product, placed upstream of a heat-shrinkage oven, and an outlet opening of the packaged product, placed downstream of the heat-shrinkage oven, such aperture being typically equipped with closing elements, for example one or more flexible strips or a mobile hatch, which, though respectively allowing entry and exit in/from the tunnel for the product transported by the first transporting means 7, prevent as much as possible heat from going out from inside the oven.

[0016] The supporting and containing structure 3 comprises a fairing 2, preferably made in its upper area, comprising side walls 11, preferably parallel to the advancement direction of the product in the packaging system 10, and entry or exit walls 12 in which inlet openings 14 and outlet openings 15 are obtained for the product in/from the packaging system 10; the entry or exit walls 12 are transverse, preferably perpendicular, to the side walls 11.

[0017] Inside the fairing 2, therefore, the following are contained, in addition to the film coils to be used and the waste coils: the film bending assembly 4, the welding bars assembly 8, the shrinkage assembly 5, and the first transporting means 7 adapted to advance the product from the inlet opening 14, through which the product to be packaged is inserted in the packaging system 10 of the invention, to the outlet opening 15 of the packaged product, through the film bending assembly 4, the welding bars assembly 8 and the shrinkage assembly 5.

[0018] Preferably, the first transporting means are composed of at least one first sliding conveyor belt 7, and are adapted to advance the product inside the packaging system 10 to allow the product to go out through the outlet opening 15.

[0019] During this exit movement of the packaged product, another product to be packaged is inserted in the packaging system 10 through the inlet opening 14, and advanced therein by means of the first conveyor belt 7, making the system continuously operating.

[0020] The advancement of the product in the packaging system 10 between the inlet opening 14 of the product to be packaged and the outlet opening 15 of the packaged product, and the operations of film bending assemblies 4, welding bars 8 and retracting bars 5 are controlled and actuated by controlling and managing means of a known type, composed for example of an electronic unit programmed for such purpose.

[0021] Preferably, at least one side wall 11 of the fairing 2 comprises a windowing 9 which can be opened to allow accessing for performing ordinary maintenance and loading and unloading of the coils, said windowing 9 comprising at least partially a portion of transparent material 16, composed for example of glass, adapted to allow viewing the interior of the packaging system 10 from outside.

[0022] In a preferred way, the packaging system 10 of the invention comprises second transporting means 18 transverse, preferably perpendicular, to the advancement direction of the product in the system 10, and adapted to receive the packaged parcel exiting from the shrinkage assembly 5 and to advance it towards third transporting means 19 transverse, preferably perpendicular, to the advancement direction of the product in the second transporting means 18 and adapted to receive the packaged parcel exiting from the second transporting means 18 and to take it next to a working area 38 for an operator responsible for entering the product in the system 10, adjacent to the inlet area of the product to be packaged in the film bending assembly 4.

[0023] Preferably, the second transporting means 18 are parallel to the entry or exit walls 12 of the fairing 2 and are adapted to receive the packaged parcel exiting from the outlet opening 15 of the product from the packaging system 10, in particular from the shrinkage assembly 5; the third transporting means 19 are parallel to the side walls 11 of the fairing 2 and are adapted to receive the packaged parcel exiting from the second transporting means 18 and to take it next to the inlet opening 14 of the product in the packaging system 10, in particular in the film bending assembly 4.

[0024] For example, the second transporting means are composed of at least one second conveyor belt 18 and the third transporting means are composed of at least one third conveyor belt 19.

[0025] The packaging system 10 according to the invention requires that fewer free areas are provided around it, with respect to the known packaging line 20, requiring in particular only the presence of an area 34 for storing the packaged products, and of an area 35 for storing products to be packaged that are on the same side of the system 10, adjacent to the inlet area of the product to be packaged and to a working area 38 for an operator responsible for entering the product in the system 10; the packaging system 10 further requires the presence of a single accessible area 37 for changing the coils of plastic film.

[0026] Advantageously, the packaging system 10 of the invention allows minimizing the overall sizes, positioning the system against a wall, for example in an angle, and performing the loading and unloading of the products from the same side of the system 10, allowing its use by a single operator who can load the products to be packaged and unload the packaged products without moving from his workplace.

Claims

1. Packaging system (10) comprising a supporting and containing structure (3) adapted to contain therein and to support:

- a film bending assembly (4) comprising a bending area (6) in which a product to be packaged is inserted in a plastic film and advanced through first transporting means (7) to arrive in a following welding bars assembly (8);
 - the welding bars assembly (8) comprising bars for welding and cutting the films adapted to perform the welding and cutting of the plastic film to make a case around the product to be packaged;
 - a shrinkage assembly (5) in which heat-shrinkage and sealing of the case around the product are performed, ending the packaging of the product, said shrinkage assembly (5) being supplied directly by the first transporting means (7) at the end of the welding and cutting operation performed in the welding bars assembly (8);

characterized in that it further comprises second transporting means (18) transverse to the advancement direction of the product in the system (10) and adapted to receive the packaged parcel exiting from the shrinkage assembly (5) and from said supporting and containing structure (3) and to advance it towards third transporting means (19) transverse to the advancement direction of the product in the second transporting means (18), said third transporting means (19) being adapted to receive the packaged parcel exiting from the second transporting means (18) and to take it next to an inlet area of the product to be packaged in the film bending assembly (4), the supporting and containing structure (3) comprising a fairing (2) comprising side walls (11) and entry or exit walls (12) in which inlet openings (14) and outlet openings (15) are obtained for the product in/from the packaging system (10), and **in that** inside the fairing (2) the following are contained: the film bending assembly (4), the welding bars assembly (8), the shrinkage assembly (5) and the first transporting means (7) adapted to advance the product from the inlet opening (14), through which the product to be packaged is inserted in the packaging system (10), to the outlet opening (15) of the packaged product, through the film bending assembly (4), the welding bars assembly (8) and the shrinkage assembly (5).

2. Packaging system (10) according to claim 1, **characterized in that** the second transporting means (18) are parallel to the entry or exit walls (12) of the fairing (2) and are adapted to receive the packaged parcel exiting from the outlet opening (15) of the product from the packaging system (10), and **in that**

the third transporting means (19) are parallel to the side walls (11) of the fairing (2) and are adapted to receive the packaged parcel exiting from the second transporting means (18) and to take it next to the inlet opening (14) of the product in the packaging system (10).

3. Packaging system (10) according to any one of the previous claims, **characterized in that** the first transporting means are composed of at least one sliding conveyor belt (7) and are adapted to advance the product inside the packaging system (10) and **in that** the second transporting means (18) and the third transporting means (19) are composed of at least one conveyor belt.

4. Packaging system (10) according to any one of the previous claims, **characterized in that** at least one side wall (11) of the fairing (2) comprises a windowing (9) which can be opened to allow accessing to perform ordinary maintenance and loading and unloading of film coils.

5. Packaging system (10) according to any one of the previous claims, **characterized in that** the shrinkage assembly (5) comprises a shrinkage tunnel comprising an inlet opening of the product, placed upstream of a heat-shrinkage oven, and an outlet opening of the packaged product, placed downstream of the heat-shrinkage oven.

6. Packaging system (10) according to any one of the previous claims, **characterized in that** the plastic film is wound in a coil contained in the packaging system (10) on a support associated with the welding bars assembly (8) or the film bending assembly (4).

7. Packaging system (10) according to any one of the previous claims, **characterized in that**, during an exit movement of the packaged product from the packaging system (10), another product to be packaged is inserted in the packaging system (10) and advanced therein by means of the first transporting means (7), making the system continuously operating.

8. Packaging system (10) according to any one of the previous claims, **characterized in that** the advancement of the product in the packaging system (10) and the operations of film bending assemblies (4), welding bars (8) and shrinkage assembly (5) are controlled and actuated by controlling and managing means of an electronic type.

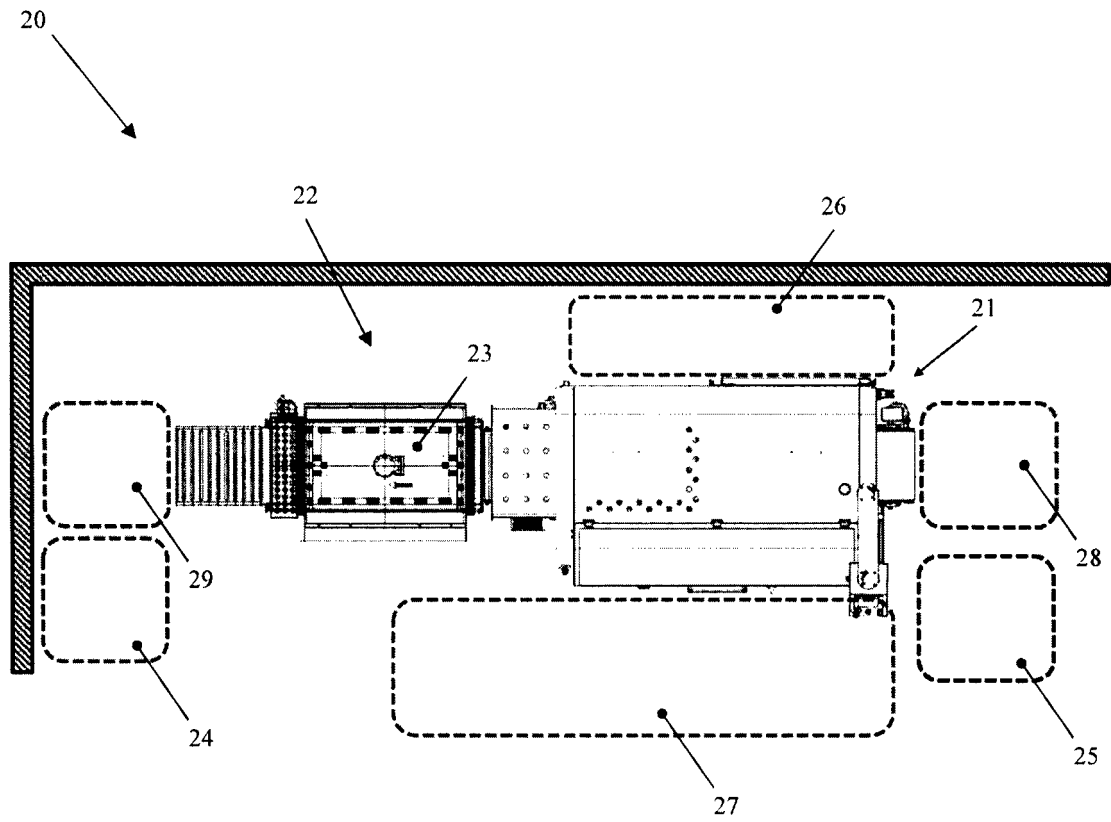


FIG. 1

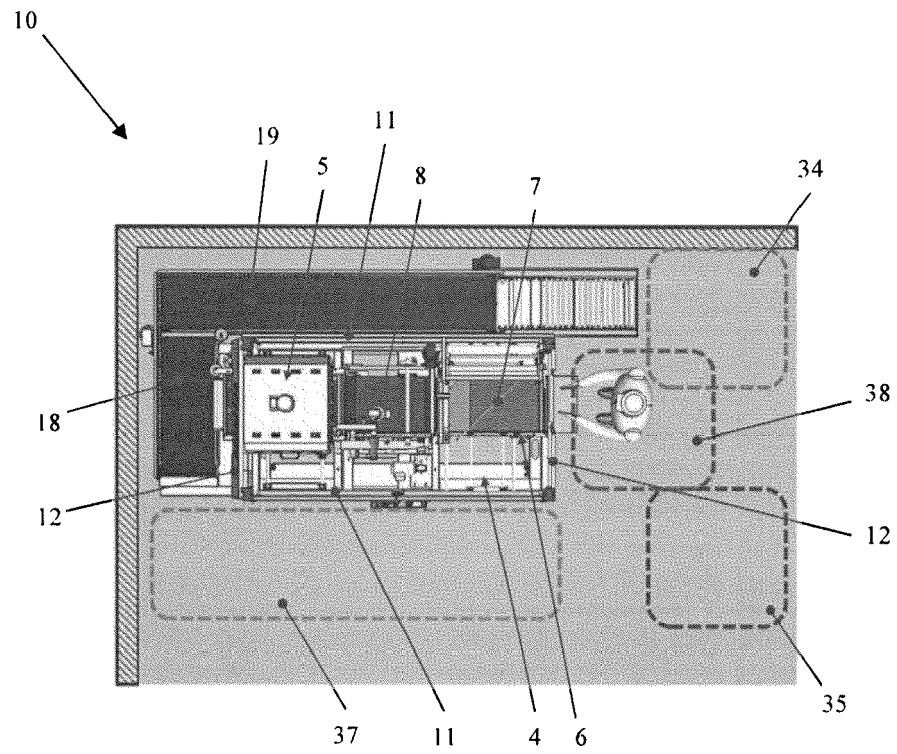


FIG. 2

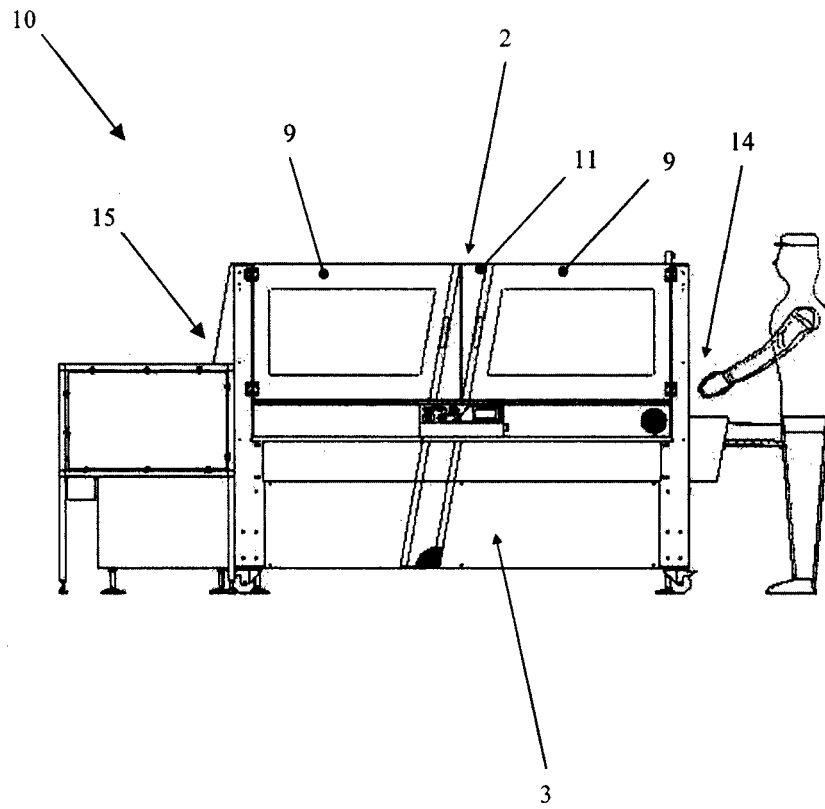


FIG. 3

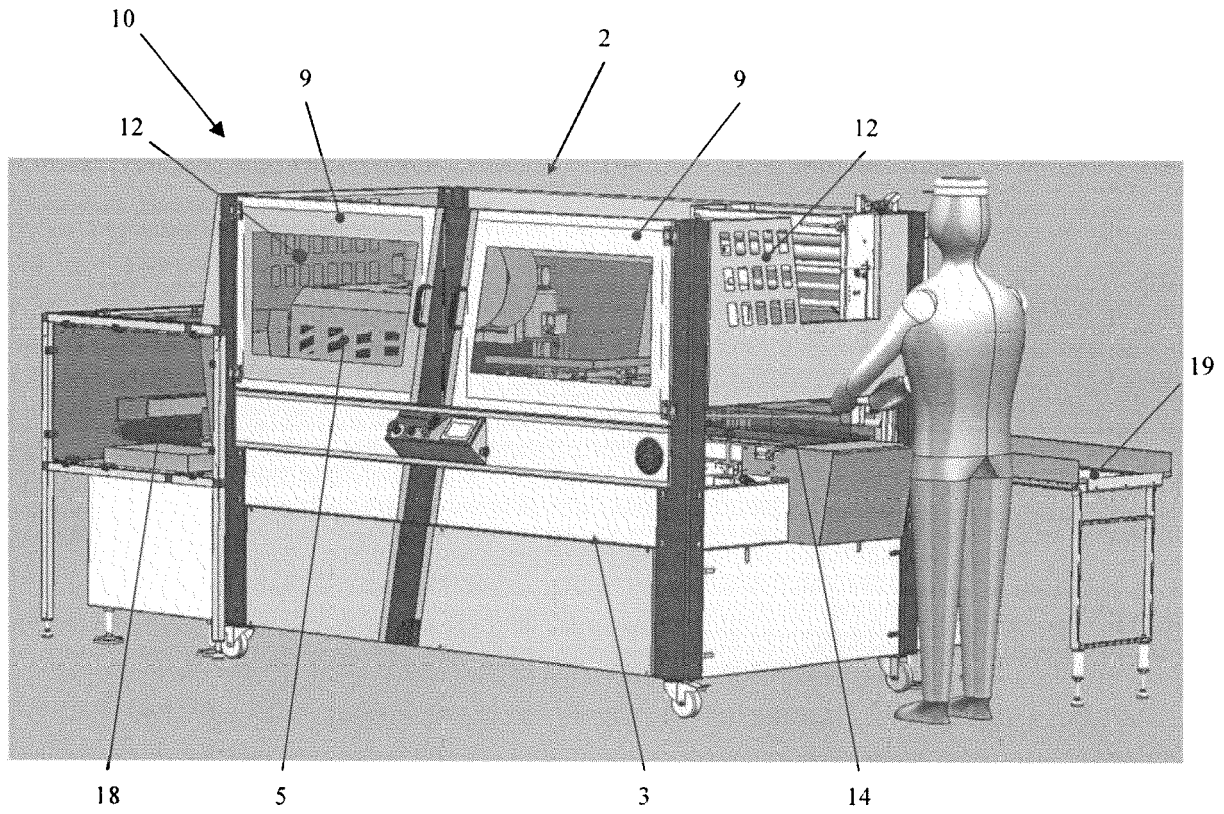


FIG. 4



EUROPEAN SEARCH REPORT

Application Number
EP 18 00 0340

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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)
X	US 4 658 569 A (HANAGATA TOSHIYUKI [JP]) 21 April 1987 (1987-04-21) * columns 3-6; figure 2 * -----	1-8	INV. B65B53/06 B65B59/04 B65B9/02
			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 21 August 2018	Examiner Lawder, M
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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21-08-2018

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