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(54) Title: PACKAGING MACHINE HAVING A MODULAR COATING UNIT

(57) Abstract: The present invention relates to a packaging machine having a modular coating unit, in order to provide coating of bed, bed base, bed headboard and similar products with a plastic-based coating material and in order to provide packaging of said products.

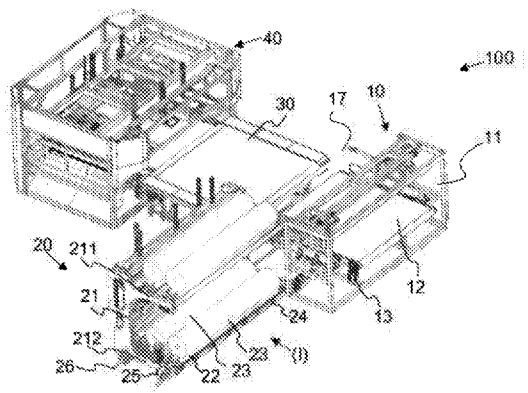


Figure 1

WO 2019/194759 A1

PACKAGING MACHINE HAVING A MODULAR COATING UNIT

TECHNICAL FIELD

The present invention relates to a packaging machine having a modular coating unit, in order to provide coating of bed, bed base, bed headboard and similar products with a plastic-based coating material and in order to provide packaging of said products.

PRIOR ART

Packaging encircles, preserves the product therein and increases the awareness for said product and supports sale of said product. For this reason, billions of dollars are spent for product packaging. Today, packaging is a very important factor and it is an important actor which guides the purchasing preferences of consumers.

The greatest importance of packaging is to form an artificial shield for the product and to protect the product from dirt and harmful bacteria. Moreover, packaging of the product is a very important tool for attracting the attention of customers, for increasing sales of the product and for the success of the marketing strategy. By means of packaging, the customers are informed about the usage, ingredient, weight, production and about any similar subjects.

Today, automatic packaging machines are used for packaging of products like bed, bed base and bed heading. Said packaging machines comprise an input unit where the product to be coated is placed, a coating unit, which provides adhesion of the package at the edges at the input part and output part of the product by passing a package onto the product transferred from the input unit, and where the coating package roll is placed, a passage conveyor which provides advancing of the product, of which the package is adhered, from the front and rear edges thereof, and edge adhesion unit parts which provide adhesion of the packages at the edge parts of the product where package is passed.

In the known state of the art, input unit, closing unit, passage conveyor and edge adhesion units, which are provided in said packaging machine, have an integrated structure. In this case, when the package roll provided on the closing unit is finished and when the package roll shall be changed, the production line is stopped and the operator changes the package

rolls existing on the upper carrier provided at the coating unit through the line and the operator changes the package rolls existing on the lower carrier provided at the coating unit through the line. This condition decreases the production efficiency since the production line stops and moreover, this makes difficult for the operator to place package roll to the coating line.

As a result, because of all of the abovementioned problems, an improvement is required in the related technical field.

BRIEF DESCRIPTION OF THE INVENTION

The present invention relates to a packaging machine having a modular coating unit, for eliminating the above mentioned disadvantages and for bringing new advantages to the related technical field.

An object of the present invention is to reduce production duration by preventing production stops in case of change of package roll thanks to the modular structure of the coating unit in the packaging machine.

Another object of the present invention is to increase labor efficiency by providing easy change of the package roll by the operator thanks to the modular structure of the coating unit in the packaging machine.

In order to realize all of the abovementioned objects and the objects which are to be deducted from the detailed description below, the present invention relates to a packaging machine in order to provide coating of bed, bed base, bed headboard and similar products with a plastic-based coating material and in order to provide packaging of said products and having a coating unit provided between an input conveyor and a passage conveyor, and at least one upper carrier whereon the coating materials can be positioned and a lower carrier provided such that there is a predetermined distance between the upper carrier and the lower carrier and a coating unit comprising at least one welding unit in order to provide welding of the coating materials, coming from the upper carrier and the lower carrier, to each other. Accordingly, the coating unit is configured to move between an operation position where it is positioned in an operation region defined between the input conveyor and the passage conveyor and a waiting position where it is positioned in a waiting region provided in the vicinity of the operation region. Thus, in case of change of the package roll, production stop is prevented and production efficiency is increased.

In a possible embodiment of the present invention, at least one wheel is provided under a body of the coating unit and at least one rail is provided whereon said wheel is positioned. Thus, movement of the coating unit to the waiting position and to the operation position is provided easily.

In a possible embodiment of the present invention, at least one rack gear is connected to the body and at least one coating unit is provided and at least one pinion gear is provided which transfers the movement, received from the movement motor, to the rack gear. Thus, movement of the coating unit to the waiting position and to the operation position is provided automatically.

In a possible embodiment of the present invention, at least one press arm is configured to move between a press position, where the upper face of the input conveyor is approached, and a free position where it is diverged. Thus, the products overcome the power of the welded coating material coming from the upper carrier and from the lower carrier in the coating unit and the products advance from the input unit towards the passage unit in a compliant manner to the movement of the conveyor.

In a possible embodiment of the present invention, the press arm is configured to stay at an arm waiting position which is a position between the press position and the free position. Thus, during the movement of the coating unit between the waiting position and the operation position, the coating unit can advance without hitting the press arm.

In a possible embodiment of the present invention, at least one drive arm is connected to the press arm and at least one drive element is connected to said drive arm. Thus, the movement of the press arm is provided.

In a possible embodiment of the present invention, the passage conveyor is configured to be able to operate in a two-directional manner in order to transfer the product from the input unit to an edge adhesion unit and in order to transfer back the product, exiting the coating unit, to the input unit. Thus, the products, desired to be coated with double-coating material, are transferred back to the input unit again easily, and second layer coating material is passed in the coating unit.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 is a representative perspective view of the subject matter packaging machine.

Figure 2 is a representative lateral view of the subject matter packaging machine.

Figure 3 is a representative perspective view of the coating unit in waiting position in the subject matter packaging machine.

Figure 4 is a representative perspective view of the coating unit in operation position in the subject matter packaging machine.

Figure 5 is a representative perspective view of the input unit in the subject matter packaging machine.

Figure 6 is a representative lateral view of the input unit in the subject matter packaging machine.

Figure 7 is a representative perspective view of the form of the reserved coating unit in waiting position in the subject matter packaging machine.

Figure 8 is a representative perspective view of the form of the reserved coating unit in operation position in the subject matter packaging machine.

DETAILED DESCRIPTION OF THE INVENTION

In this detailed description, the subject matter packaging machine (100) having modular coating unit (20) is explained with references to examples without forming any restrictive effect only in order to make the subject more understandable.

In Figure 1, a representative perspective view of the subject matter packaging machine (100) is given. The present invention relates to a packaging machine (100) having modular coating unit (20) in order to provide coating of bed, bed base, bed headboard and similar products with a plastic-based coating material and in order to provide packaging of said products. Said packaging machine (100) comprises an input unit (10) where the product, which is to be packaged, enters to the line; a coating unit (20) comprising at least one upper carrier (211) whereon the coating roll (23) is positioned and at least one lower carrier (212) provided such that there is a predetermined distance between the upper carrier (211) and the lower carrier (212); at least one passage conveyor (30) where the products pass whereon package is passed; and an edge adhesion unit (40).

In Figure 5, a representative perspective view of the input unit (10) in the subject matter packaging machine (100) is given. Said input unit (10) comprises an input conveyor (12) where the product to be packaged is placed. In said input unit (12), there is a conveyor motor (13) which provides the rotational movement of said input conveyor (12). Moreover, in said input unit (10), there are lateral support walls (15) for providing uniform advancing of the product, placed on the input conveyor (12), on the line. Said lateral support walls (15) exert pressure onto the product through the lateral surfaces and provide the product to be in the middle of the input conveyor (12). The forward-backward movement of said lateral support walls (15) in the orthogonal direction to the product advancing direction is provided by the support wall drive motor (16). In said input unit (10), in order to provide easy passage of the product, placed on the input conveyor (12), to the next coating unit (20), there is at least one press arm (17) configured to move between a press position where the press arm (17) approaches the upper face of the input conveyor (12) and a free position where the press arm (17) diverges from the upper face of the input conveyor (12). By means of said press arm (17), pressure is exerted onto the product which is going to pass to the next unit and the product moves in the direction of the movement of the input conveyor (12). There is at least one drive arm (171) which provides movement of said press arm (17) between the press position where said press arm (17) approaches the upper surface of the input conveyor (12) and the free position where said press arm (17) diverges from the upper surface of the input conveyor (12). There is at least one drive element (172) for providing drive to said drive arm (171). Said press arm (17) is configured to stay in an arm waiting position (III) which is between the press position and the free position. As can be seen in Figure 6, there is at least one linear drive element (14) in order to provide linear movement in the forward and backward direction in the product advancing direction. All items in the input unit are positioned on a chassis (11) comprising profile structure.

As can be seen in Figure 3 and 4, the coating unit (20) is configured to move between an operation position (I) and a waiting position (II) where said coating unit (20) is positioned in a waiting region provided in the vicinity of the operation region. Said coating unit (20) comprises a C-like body (21) structure. In said body (21) structure, there is at least one upper carrier (211) and at least one lower carrier (212) provided such that there is a predetermined distance between said upper carrier (211) and said lower carrier (212). There is at least one roller (22) on said upper carrier (211) and on said lower carrier (212). At least one coating roll (23) is positioned in order to be used in packaging on said roller (22) provided between said upper carrier (211) and said lower carrier (212). Said rollers (22) provide easy rotation of the coating rolls (23). In said coating unit (20), there is at least one welding unit (29) in order to provide welding of coating materials, coming from said upper carrier (211) and from said

lower carrier (212), to each other. In said coating unit (20), there is at least one wheel (25) provided under said body (21) structure and there is at least one rail (26) whereon said wheel (25) is positioned. Movement of said coating unit (20) between a waiting position (I) and an operation position (II) can be provided by means of pushing by the operator and manual and/or automatic movement can be provided by means of advancing the wheel (25), provided under said body (21), on said rail (26). There is at least one movement motor (27) which provides automatic movement of said coating unit (20). There is at least one pinion gear (28) where said movement motor (27) provides movement. There is at least one rack gear (24), connected to said body (21), driven by said pinion gear (28) and which provides advancing of said coating unit (20) between an operation position (I) and a waiting position (II).

As can be seen in Figure 7 and 8, in case the coating rolls (23), provided at the coating unit (20), are finished, said coating unit (20) is taken to the waiting position (I) and the coating rolls (23) are changed. Meanwhile, in order to prevent stopping of the packaging machine (100), at least one coating unit (20), provided as reserved, is moved to the operation position (II).

After said coating unit (20), the product advances on at least one passage conveyor (30) and passes to the edge adhesion unit (40) for welding of the coating material through the lateral edges of the products where the coating material is welded from the front and rear edges in the coating unit (20). Packaging is completed after said edge welding unit (40).

The operation of the packaging machine (100) is as follows; the product to be packaged is placed onto the input conveyor (12) provided on the input unit (10). In order to provide advancing of the product, positioned at said input conveyor (12), in a uniform manner on the line, the lateral support walls (15) exert pressure to the product from the lateral surfaces thereof and provide the product to be positioned at the middle on the input conveyor. Meanwhile, in said coating unit (20) in a prior packaging process, the coating materials, which come from said upper carrier (211) and from said lower carrier (212), are welded to each other by means of the welding unit (29). Pressure is exerted by the press arm (17) onto the front surface in the advancing direction of the product which is to be transferred from said input conveyor (12) to the coating unit (20). The product, where press is exerted, advances in an easier manner in the direction of the movement of the input conveyor (12) and exceeds the power of the welded coating material and said coating material is easily passed onto the product surface in the direction which is opposite to the product coming direction. As the passing of the coating material onto the product is completed, the coating material, provided

at the rear edge of the product is welded and cut by means of the welding unit (29) provided at said coating unit (20). Thus, the coating material is welded at the front and rear edge of the product and the welding process of the coating material, coming from the upper carrier (211) and from the lower carrier (212) for the next product to be coated, is completed. Afterwards, the product advances on the passage conveyor (30) and the product is transferred onto the edge adhesion unit (40). The coating materials, provided at the side of the edge surface of the product at said edge adhesion unit (40), are welded. Thus, product packaging process is completed.

In case the coating material provided at said coating rolls (23) provided at said coating unit (20) is finished, the coating unit (20) is moved to the waiting position (I). In order to provide movement of said coating unit (I) to the waiting position (I), first of all, the input conveyor (12) is moved backwardly in the direction, which is opposite to the direction of arrival of the product, by means of the linear drive element (14). Meanwhile, said press arm (17) provided at the input unit (10) is positioned at an arm waiting position (III) which is between the press position and the free position. Thus, during movement of said coating unit (20), it is prevented from hitting said press arm (17). Afterwards, in order to provide movement of said coating unit (20) to the waiting position (I), movement is provided to the pinion gear (28) by the movement unit (20) and said pinion gear (28) provides movement to said rack gear (24) provided at the coating unit (20) and connected to the body (21) and said coating unit (20) is advanced to the waiting position (I). Meanwhile, the reserved coating unit (20) is brought to the operation position (II) in order to prevent stopping of the packaging machine (100). After the reserved coating unit (20) arrives at the operation region, the input conveyor (12) again advances in the product arrival direction by means of the linear drive element (14). Thus, the finished coating rolls (23) in the coating unit (20) which advances towards the waiting position (I) can be changed.

Some products which are to be packaged in the packaging machine (100) may optionally be desired to be coated with coating material as double layers. In order to provide coating of the products with double-layer, the products, which enter through the input unit (10), are passed to the coating unit (20) and here, first layer of coating material is passed onto the product and the products, whose package is welded from the front and rear edges, advance to the passage conveyor (30). Afterwards, the coating unit (20) is taken to the waiting position (I) and the passage conveyor (30) moves in the direction which is opposite the product coming direction and provides the product to advance to the input unit (10) again. Afterwards, the coating unit (20) passes to the operation position (II) again and in order to provide the products, coated with the first layer coating material from the input unit (10), to be coated

with the second layer coating material, the products are passed to the coating unit (20) again. The products, which are coated with double-layer coating material, are transferred to the edge adhesion unit (40) through the passage conveyor (30). Here, the packaging process of the products, welded with the coating material from the lateral edges, is completed.

Thus, in the coating unit (20), in case the coating material is finished and in case product is desired to be packaged with the double-layer coating material, the coating unit (20) is easily moved and the stop of the packaging machine (100) is prevented thanks to the usage of the reserved coating unit (20), and thereby, production efficiency is increased.

The protection scope of the present invention is set forth in the annexed Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

REFERENCE NUMBERS

100. Packaging machine

10. Input unit
- 11. Chassis
- 12. Input conveyor
- 13. Conveyor motor
- 14. Linear drive element
- 15. Lateral support wall
- 16. Support wall drive motor
- 17. Press arm
  - 171. Drive arm
  - 172. Drive element
  - (III) Arm waiting position

20. Coating unit
- 21. Body
  - 211. Upper carrier
  - 212. Lower carrier
- 22. Roller
- 23. Coating roll
- 24. Rack gear
- 25. Wheel
- 26. Rail
- 27. Movement motor
- 28. Pinion gear
- 29. Welding unit

(I) Waiting position

(II) Operation position

30. Passage conveyor

40. Edge adhesion unit

CLAIMS

1. A packaging machine in order to provide coating of bed, bed base, bed headboard and similar products with a plastic-based coating material and in order to provide packaging of said products and having a coating unit provided between an input conveyor (12) and a passage conveyor (30), and at least one upper carrier (211) whereon the coating materials can be positioned and a lower carrier (212) provided such that there is a predetermined distance between the upper carrier (211) and the lower carrier (212) and a coating unit (20) comprising at least one welding unit (29) in order to provide welding of the coating materials, coming from the upper carrier (211) and the lower carrier (212), to each other; **characterized** in that the coating unit (20) is configured to move between an operation position (II) where it is positioned in an operation region defined between the input conveyor (12) and the passage conveyor (30) and a waiting position (I) where it is positioned in a waiting region provided in the vicinity of the operation region.

2. A packaging machine (100) according to claim 1, wherein at least one wheel (25) is provided under a body (21) of the coating unit (20) and at least one rail (26) is provided whereon said wheel (25) is positioned.

3. A packaging machine (100) according to claim 1, wherein at least one rack gear (24) is connected to the body (21) and at least one coating unit (20) is provided and at least one pinion gear (28) is provided which transfers the movement, received from the movement motor (27), to the rack gear (24).

4. A packaging machine (100) according to claim 1, wherein at least one press arm (17) is configured to move between a press position, where the upper face of the input conveyor (12) is approached, and a free position where it is diverged.

5. A packaging machine (100) according to claim 1, wherein the press arm (17) is configured to stay at an arm waiting position (III) which is a position between the press position and the free position.

6. A packaging machine (100) according to claim 1, wherein at least one drive arm (171) is connected to the press arm (17) and at least one drive element (172) is connected to said drive arm (171).

7. A packaging machine (100) according to claim 1, wherein the passage conveyor (30) is configured to be able to operate in a two-directional manner in order to transfer the product from the input unit (10) to an edge adhesion unit (40) and in order to transfer back the product, exiting the coating unit (20), to the input unit (10).

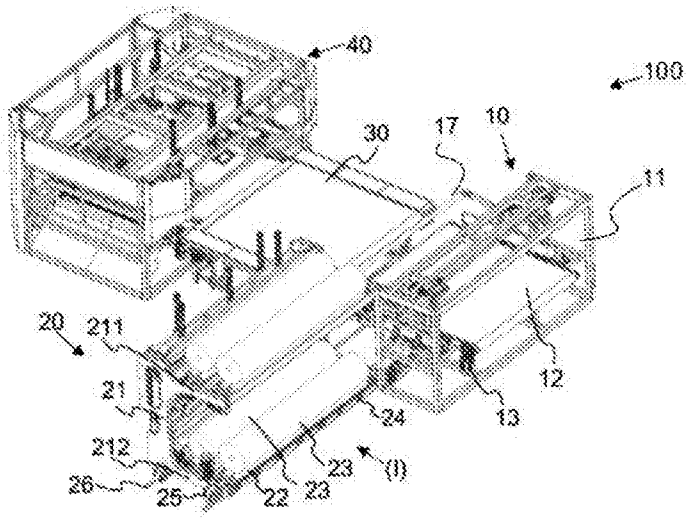


Figure 1

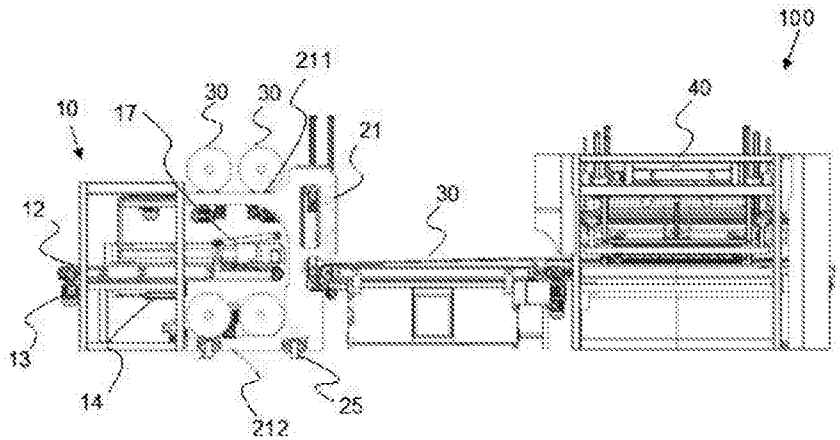


Figure 2

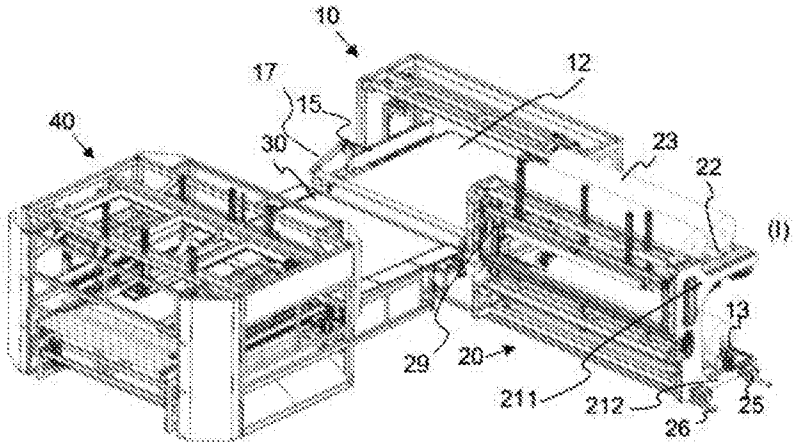


Figure 3

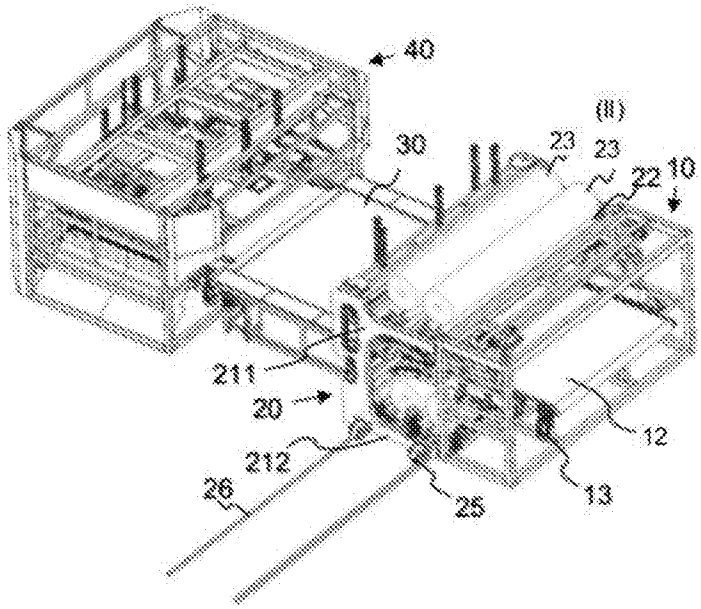


Figure 4

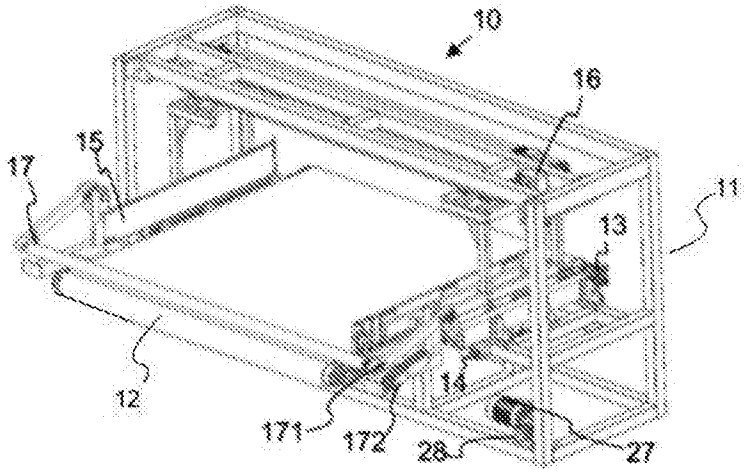


Figure 5

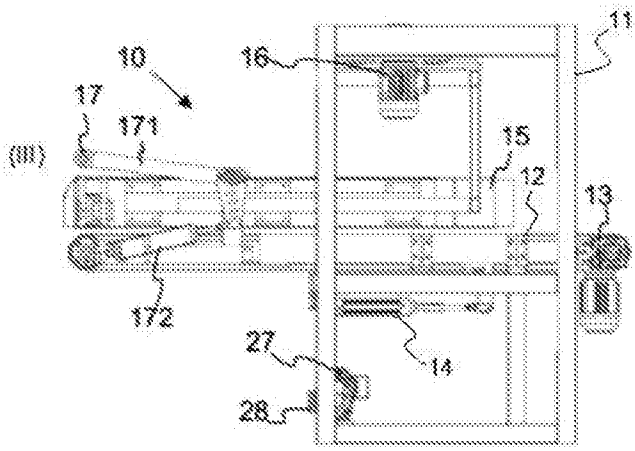


Figure 6

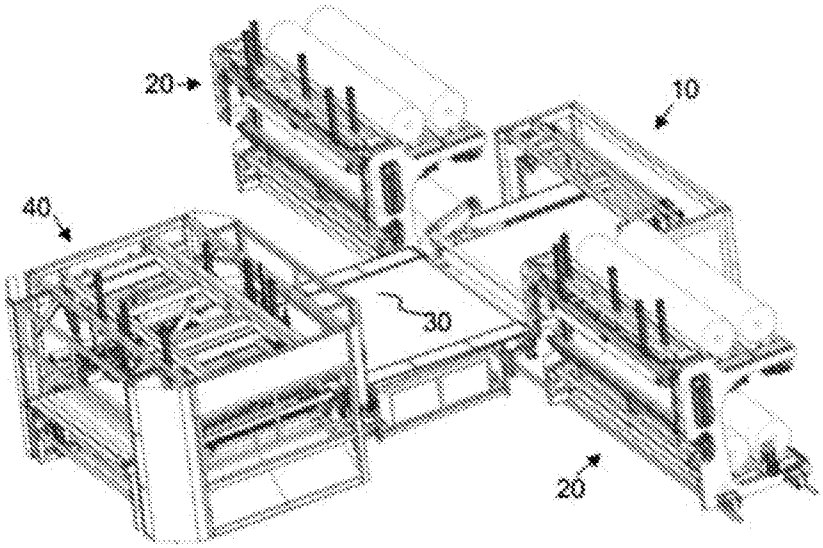


Figure 7

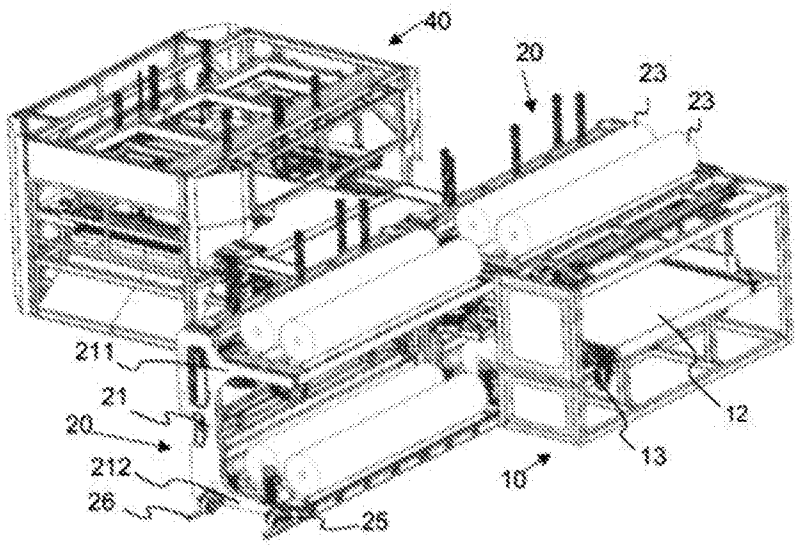


Figure 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/TR2018/050192

A. CLASSIFICATION OF SUBJECT MATTER

B65B 9/02 (2006.01)i; B65B 63/02 (2006.01)i; B65D 75/30 (2006.01)i; B65D 75/52 (2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65B; B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

TURKPATENT Patent Database

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO Abstract & Fulltext Databases, WPI Data & Keywords: bed, box spring, packaging, packing, wrapping, coating, coating line, conveyor, transport, furniture, shrink machine

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 0075016 A1 (L & P PROPERTY MANAGEMENT CO [US]) 14 December 2000 (2000-12-14) The Whole Document	1-7
A	US 2008086984 A1 (PRIMO INTERNAT [CA]) 17 April 2008 (2008-04-17) The Whole Document	1-7
A	US 7383676 B1 (ATLANTA ATTACHMENT CO [US]) 10 June 2008 (2008-06-10) The Whole Document	1-7

☐ Further documents are listed in the continuation of Box C.

☑ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT
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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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