(19) Europäisches Patentamt
European Patent Office
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(11) **EP 3 838 774 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.06.2021 Bulletin 2021/25

(51) Int Cl.:
B65B 11/04 *(2006.01)*

(21) Application number: **20215598.2**

(22) Date of filing: **18.12.2020**

(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
KH MA MD TN

(30) Priority: **18.12.2019 IT 201900024484**

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

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

(74) Representative: **Manzella & Associati**
Via dell'Indipendenza, 13
40121 Bologna (IT)

(54) APPARATUS FOR WINDING PRODUCTS WITH A FILM OF WINDING MATERIAL

(57) The apparatus for winding products with a film of winding material comprises a base frame (2), a rotary table (3) on which a product to be wound is arranged, a motor member (4) arranged on said frame base (2), said rotary table (3) being rotatable around a vertical rotation axis upon actuation of said motor member (4), a column (8) associated with said base frame (2), a dispensing device (7) holding a reel of winding material, which is movable along said column (8).

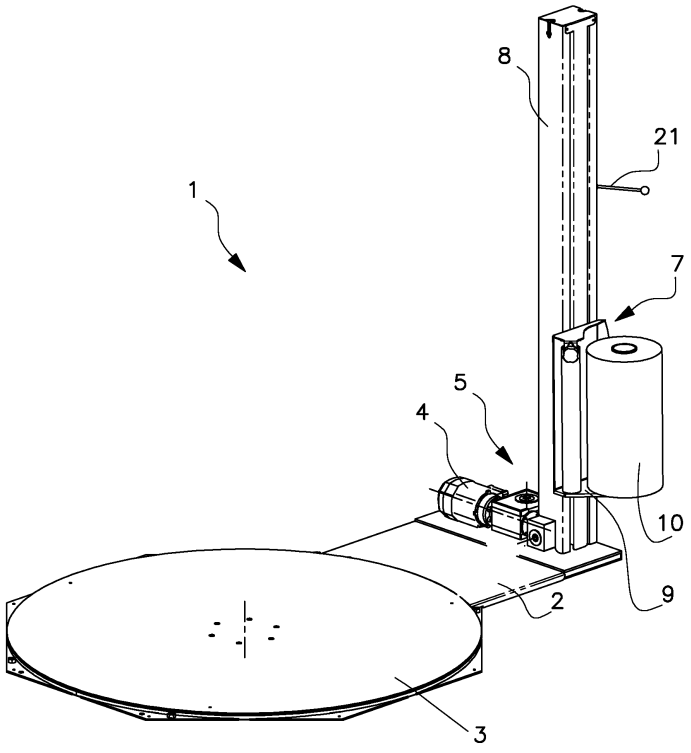

Fig.1

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Description

Technical field

[0001] The present invention relates to an apparatus for winding products with a film of winding material.

Prior art

[0002] The use of apparatuses for automatic or semi-automatic winding of products with a film of winding material has long been known.

[0003] One type of known apparatuses is provided with a rotating table, which may be rotated along a vertical axis, on which the product or products to be wound are arranged. The apparatus includes a base frame with which a column that holds a dispensing device, operated in translational motion along the column, is associated. The dispensing device supports a reel of material that is unwound, in use, to be wrapped around the side surface of the product. The combination of the rotation motion of the table on which the product is arranged and the translation motion of the dispensing device determine the spiral winding of the material around the product.

[0004] An example of the aforementioned type of apparatus is shown in application EP 1 083 126. The apparatus includes a base frame on which a column that carries a dispensing device is mounted. Connected to the base frame is a table, which is rotated around a vertical axis by a first motor member, arranged at one end of the base frame. The dispensing device is movable along the column by activating a second motor member, placed inside the column.

[0005] A problem complained of is the frequent maintenance of the machine, which is necessary to ensure the correct handling of the table and the dispensing device and, consequently, the operating costs of the machine are high.

[0006] A solution that has been worked out to solve the problem provides for an apparatus comprising a rotating table rotated by a motor member, a column on which a dispensing device is mounted movably, which is moved manually by an operator according to a translational movement.

[0007] The operator moves the device alternately downwards and upwards, in order to carry out the winding operation around the product.

[0008] This solution has some disadvantages linked to the manual handling of the dispensing device, although it is structurally simpler. For example, the product packaging achieved is not optimal, due to uneven material overlapping around the product.

[0009] A further disadvantage is dimensional limitations that are imposed on the product and the weight limitations of the reel still for the manual handling of the dispensing device. Furthermore, it must also be considered that the operation that must be carried out manually is tiring for the operator.

[0010] Therefore, the need is felt to devise an apparatus that overcomes the aforementioned problems.

Disclosure

[0011] The aim of the present invention is to solve the aforementioned problems, devising an apparatus for winding products with a film of winding material capable of winding the products easily.

[0012] A further object of the present invention, within this aim, is to provide an apparatus that is easy to manage.

[0013] Another object of the invention is to provide an apparatus that is ergonomic.

[0014] A still further object of the invention is to provide an apparatus for winding products with a film of winding material having simple construction and functional conception, reliable operation, versatile use, and relatively inexpensive cost.

[0015] The aforementioned purposes are achieved, according to the present invention, by the apparatus for winding products with a film of winding material according to claim 1.

[0016] The apparatus for winding products with a film of winding material comprises a base frame, a rotating table on which a product to be wound is arranged, a motor member, said rotating table being rotatable around a vertical rotation axis upon actuation of said motor member, a column associated with said base frame, a dispensing device configured to carry a reel for feeding said winding material, said dispensing device sliding along said column.

[0017] The apparatus comprises a transmission unit configured to transform a rotary motion of a shaft rotated by said motor member into a sliding motion of said delivery device along said column.

[0018] An advantage of this apparatus is the fact that the management of the apparatus is optimised since the motor utilized to rotate the rotating table is also utilized to move the dispensing device thanks to the provision of the transmission unit. Maintenance operations are therefore facilitated and, consequently, management costs are reduced.

[0019] In addition, the apparatus is ergonomic, as the operator does not have to manually move the dispensing device along the column.

[0020] Preferably, said transmission unit is arranged inside said column.

[0021] Preferably, said transmission unit is arranged in a base portion of said column.

[0022] Preferably, said shaft is housed, at least in part, in said base portion of said column.

[0023] Preferably, said motor member is associated with a reduction unit configured to transmit motion according to a predetermined transmission ratio.

[0024] According to an aspect of the invention, said shaft is an output shaft of said reduction unit.

[0025] Advantageously, said apparatus comprises a

coupling device configured to control said translational motion of said dispensing device according to a lifting or lowering direction.

[0026] Preferably, said dispensing device comprises a carriage, which forms a support base for said reel of winding material.

[0027] Preferably, said apparatus comprises a control member connected to said coupling device to control the actuation of the translational motion of said dispensing device according to said lifting or lowering direction.

[0028] Preferably, said control member is a control lever.

[0029] Advantageously, said transmission unit comprises a first driving member and a second driving member, rotated by said driving member, a first driven member and a second driven member, said coupling device selectively operating said first driven member or said second driven member, a transformation device configured to transform the rotary motion selectively transmitted to said first driven member or to said second driven member into said translational sliding motion of said dispensing device.

[0030] Preferably, said first driving member and said second driving member are made of hubs keyed on said shaft.

[0031] Preferably, said first driven member and said second driven member are made from idle pulleys keyed on said shaft.

[0032] Preferably, said coupling device is made by means of a fork member, selectively movable, along said shaft, upon command of said control member, to couple said first driven member with said first driving member or said second driven member with said second driving member.

[0033] Preferably, each said driven member has a relative engagement toothing, facing, in use, towards the respective driving element, each driving element having a toothing capable of engaging said engagement toothing to transmit the rotary motion.

[0034] According to an aspect of said invention, alternatively, between each said driving member and the related driven member a friction transmission device is interposed to transmit the rotary motion.

[0035] The friction transmission device may be, for example, a torque limiting device.

[0036] Preferably, said apparatus comprises elastic contrast means acting on said first driven member and said second driven member so as to cause its disengagement from said first driving member and said second driving member when said control member is deactivated.

[0037] Preferably, said transformation device comprises a first transmission pulley and a second transmission pulley for transforming, by means of the interposition of flexible means, the motion of rotation transmitted by the activation made by said coupling device in a lifting or lowering translational motion of said delivery device.

[0038] Preferably, said flexible means are wound around said first return pulley so as to have a first branch and a second branch, said first branch being wound around said first driven member and said second branch being wound around said second driven member in order to rejoin around said second transmission pulley.

[0039] Preferably said flexible means are belt means, for example with toothed belt.

[0040] According to an aspect of the invention, said transformation device comprises, alternatively, a first flexible member and a second flexible member respectively wound around said first driven member and said second driven member. These flexible members enable the transmission of the motion resulting from the selective actuation of the first driven member and the second driven member.

[0041] Preferably, each said flexible member is wound around the respective driven member and a respective pulley.

[0042] Preferably, said flexible members are annular transmission elements, for example chains.

[0043] Preferably, said dispensing device is fixed to said flexible members in a crossed way, to selectively operate the lifting or lowering of said reel along said column.

[0044] Preferably, when said coupling device is quiescent with respect to said first driven member and said second driven member, these are idle on said shaft, and therefore said dispensing device is locked in standby at the level in which it is located.

Description of drawings

[0045] The details of the invention will become more evident from the detailed description of a preferred embodiment of the apparatus for winding products with a film of winding material according to the invention, shown by way of example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the apparatus object of the present invention;

Figure 2 is a perspective view of an enlarged detail of the apparatus;

Figures 3a, 4a, 5a and 3b, 4b, 5b respectively, as well as 3c, 4c, 5c are respectively a schematic view of the apparatus according to the invention, a view of a portion of the apparatus wherein a control lever and a front view of a transmission unit used in the apparatus according to the invention, in different operating conditions are visible;

Figures 6a, 7a, 8a and 6b, 7b, 8b respectively, as well as 6c, 7c, 8c are respectively a schematic view of the apparatus according to a different embodiment, a view of a portion of the apparatus according to this embodiment wherein the control lever is visible, as well as a front view of a transmission unit used in the apparatus, again according to this embodiment, in different operating conditions;

Figures 9, 10 and 11 are respective perspective

views of a detail of the transmission unit according to different embodiments.

Best mode

[0046] With particular reference to these figures, 1 indicates the apparatus for winding products with a film of wrapping material according to the present invention.

[0047] The apparatus 1 comprises a base frame 2 which supports a rotating table 3, on which the product or products to be wound, not visible in the figures, is/are arranged.

[0048] The word "product" will be used below to designate a single product or series of products, for simplicity.

[0049] The rotary table 3 is rotated around a vertical axis of rotation by a drive member 4, arranged on the base frame 2. Preferably, the rotary table 3 has a circular shape.

[0050] The motor 4 transmits motion to the rotating table 3 via transmission means, not visible in the figures.

[0051] The motor member 4 is also designed for moving a transmission unit 6, which transforms the rotary motion of a shaft rotated by the motor member 4 in a translational motion of a dispensing device 7, as explained below.

[0052] According to an embodiment, the motor member 4 is associated with a reduction unit 5 configured to transmit motion according to a predetermined transmission ratio. The reduction unit 5 may comprise a first reduction member, which transmits motion to the rotating table 3, and a second reduction member, arranged to move the transmission unit 6.

[0053] A column 8 is fixed to the base frame 2, which is preferably arranged adjacent to the motor member 4.

[0054] Column 8 carries the dispensing device 7 sliding along column 8. In particular, the dispensing device 7 may be operated in a translational motion along the column 8, alternately in a downward motion and in an upward motion, upon activation of the transmission unit 6.

[0055] The dispensing device 7 comprises a carriage 9 which forms a support base for a reel 10 of winding material.

[0056] The transmission unit 6 is preferably arranged in a base portion of the column 8 and comprises a first driving member 11, keyed on a shaft 12 rotated by the motor member 4.

[0057] The shaft 12 is housed, at least in part, in the base of the column 8 and extends transversely with respect to the column 8.

[0058] The shaft 12 may be an output shaft of the reduction unit 5.

[0059] The first driving member is preferably made up of a hub 11.

[0060] A second driving member 13, for example a hub, is also keyed onto the shaft 12.

[0061] The first hub 11 and the second hub 13 have, preferably laterally, a relative toothing 14 facing towards an operative, for example central, portion of the transmission unit 6, for the activation of the sliding motion of the carriage 9 along the column 8 (see, for example, Figure 9).

[0062] According to an embodiment, between the shaft 12 and each toothing 14 a clutch transmission device 300 is mounted, which makes the motion transmission more flexible (see Figure 10).

[0063] The operating portion of the transmission unit 6 comprises a first driven member, for example a first pulley 15, and a second driven member, for example a second pulley 16, and a coupling device 17.

[0064] The coupling device 17 is made up of a fork member interposed between the first pulley 15 and the second pulley 16.

[0065] The first pulley 15 and the second pulley 16 are mounted idly and sliding along the shaft 12 and have a respective first engagement toothing 18, arranged on the side facing the coupling device 17. The first pulley 15 and the second pulley 16 have respective second engagement teeth 19 facing respectively the first hub 11 and the second hub 13 for transmitting the motion.

[0066] A different mechanism for transmitting the rotary motion between each hub 11, 13 and the relative pulley 15, 16 may be used, for example a transmission clutch 300' (see Figure 11).

[0067] The transmission clutch 300' is interposed between each hub 11, 13 and the relative pulley 15, 16.

[0068] The transmission clutch 300' may comprise a torque limiting device, not described, as it is known per se. According to this embodiment, each hub 11, 13 therefore does not have a toothing 14 facing the operating portion and the relative pulleys 15, 16 do not have, in the same way, the second engagement toothing 19.

[0069] Contrasting means 20, for example of the elastic type, preferably with spring, are interposed between each pulley 15, 16 and, respectively, the first hub 11 and the second hub 13, to keep the same pulleys 15, 16 in a condition of idle keying on the shaft 12, away from the aforementioned coupling device 17.

[0070] The apparatus includes a control member 21, for example a control lever, to operate the selective engagement of one of the pulleys 15, 16 and, respectively, the first hub 11 and the second hub 13.

[0071] The control lever 21 is connected, by means of connection members, to the coupling device 17, in practice to the aforementioned coupling fork member, so as to selectively actuate the sliding motion of the carriage 9.

[0072] In particular, the fork member 17, upon actuation of the control lever 21, may selectively actuate the first pulley 15 or the second pulley 16, moving it in opposite direction or direction along the shaft 12, so as to cause its coupling, preferably by meshing, respectively, with the first hub 11 or with the second hub 13.

[0073] The pulley 15, 16 thereby operated by the selective actuation of the coupling fork member 17 is therefore made integral with the relative hub 11, 13, integral, in turn, with the rotation of the shaft 12, movable by the

motor member 4.

[0074] The pulleys 15, 16 are in turn connected to a transformation device 22, configured to transform the rotary motion given to one of the pulleys 15, 16 into a translational motion for sliding of the carriage 9 along the column 8.

[0075] The transformation device 22 comprises, for example, a first transmission pulley 23 and a second transmission pulley 24, around which flexible transmission means 25 can be wound to ensure that the rotational motion transmitted by the selective activation operated by the coupling device 17 of the transmission unit 6 is transformed into a translational motion, having a lifting or lowering direction, corresponding to the aforementioned selective activation.

[0076] The transmission means 25 may comprise belt means, preferably with toothed belt (see Figures 3a, 4a and 5a).

[0077] The transmission means 25 are wound around the first transmission pulley 23, so as to have a first branch 26 and a second branch 27.

[0078] The aforesaid branches 26, 27 are respectively wound around the first pulley 15 and the second pulley 16, to rejoin around the second return pulley 24. In this way, the translational motion deriving from the rotary motion transmitted by the selective actuation of the first pulley 15 is opposite, in particular in the lifting direction of the carriage 9 (see in particular Figures 3a, 3b and 3c), with respect to the translational motion deriving from the selective actuation of the second pulley 16 (see figures 5a, 5b and 5c), resulting in a lowering motion of the same carriage 9.

[0079] On the other hand, when the coupling device 17 is inactive with respect to the pulleys 15, 16, and therefore distant from them, these are idle on the shaft 12, preferably mutually engaged, and therefore the carriage 9 is locked stationary at the height at which it is located (see Figures 4a, 4b, and 4c).

[0080] The operation of the apparatus for winding products with a film of winding material is easily understood from the above description.

[0081] Before the beginning of a winding cycle, an operator prepares a reel 10 of winding material on the carriage 9 and a product to be wound is also positioned on the rotary table 3.

[0082] An operator then starts the winding cycle by switching on the apparatus 1. Consequently, the rotary table 3 is rotated around its axis of vertical rotation by the motor member 4 and the motor member 4, upon the movement of the control lever 21 by the operator, is operated by means of the transmission unit 6 the sliding of the carriage 9 to make a spiral winding of the material around the product.

[0083] More in detail, the operator then moves the control lever 21 in one direction or in the opposite direction to operate the fork coupling member 17 which moves the first pulley 15 or the second pulley 16 along the shaft 12 causing coupling thereof with the first hub 11 or with the second hub 13 respectively. In this way, the rotary motion of the shaft 12 is transmitted by means of the first hub 11 or the second hub 13 respectively to the first pulley 15 or to the second pulley 16 and, by means of the transformation device 22, the rotary motion of the pulley 15, 16 is converted into the translational motion of the carriage 9 in the corresponding direction (see Figures 3a, 3b, 3c and 5a, 5b, 5c).

[0084] When the coupling fork member 17 is inactive with respect to the pulleys 15, 16 these are idle on the shaft 12, preferably mutually engaged, and therefore the carriage 9 is locked stationary at the height at which it is located (see Figures 4a, 4b and 4c).

[0085] The operator, by moving the control lever 21, controls the motion of the carriage in the desired direction and its stop based on the desired winding characteristics.

[0086] According to a different embodiment, illustrated in figures 6a, 6b and 6c, 7a, 7b, 7c, 8a, 8b and 8c, it is possible to provide that the transformation device 220 comprises different flexible means for each driven member of the transmission unit 60.

[0087] More precisely, the transformation device 220 comprises a first flexible member 250 and a second flexible member 251, for the transmission of motion, respectively, deriving from the selective actuation of the first driven member 150 and of the second driven member 160.

[0088] In particular, the first flexible member 250 and/or the second flexible member 251 are annular transmission elements, for example chains.

[0089] The first flexible member 250 is therefore wound around the first driven member 150 and a respective pulley 280. Likewise, the second flexible member 251 is wound around the second driven member 160 and a respective further pulley 290.

[0090] From these windings, a first branch 230 and a second branch 231 are therefore defined for the first flexible member 250 and, a first branch 240 and a second branch 241 for the second flexible member 251.

[0091] According to the illustrated embodiment, the carriage 90 holding the reel 10 is fixed to the aforementioned flexible members 250, 251, in a cross way, to selectively operate the lifting or lowering of the reel 10 along the column 8. More precisely, the carriage 90 is fixed integrally with only one branch of each flexible member 250, 251, chosen in such a way as to ensure that the same carriage 90 is integral with branches which are wound so as to translate in the opposite direction, if operated by the respective driven member 150, 160,

[0092] The operation of the apparatus, even in this case, is understandable from the description above.

[0093] Before the beginning of a winding cycle, an operator prepares a reel 10 of winding material on the carriage 90 and a product to be wound is also positioned on the rotary table 3.

[0094] An operator then starts the winding cycle by switching on the apparatus 1. The rotary table 3 is then rotated around its vertical rotation axis by the motor 4

and the same motor 4, upon movement of the control lever 21 by the operator, operates, the sliding of the carriage 90, by means of the transmission unit 60, to carry out a spiral winding of the material around the product.

[0095] The operator acts on the control lever 21, in one direction or in the opposite direction, in order to selectively activate the coupling device 170 for the engagement of the first pulley 150 or the second pulley 160. When the first pulley 150 is selectively operated by the coupling device 170, the first flexible member 250 transmits the motion received by the first pulley 150, causing, in the illustrated case, the lifting of the carriage 90, by virtue of the connection to the second branch 231. At the same time, the second flexible member 251, by virtue of the connection of the carriage 90 to the first branch 240, can be dragged in the same lifting motion as the carriage 90, the second driven organ 160 being idle on the shaft 120. In the case in which the second pulley 160 is selectively selected by the coupling device 170, the second flexible member 251 transmits the motion received by the second pulley 160 causing the lowering of the carriage 90 due to the connection to the second branch.

[0096] Finally, when the coupling device 170 is not activated, as in the previously described embodiment, the first driven member 150 and the second driven member 160 are idle on the shaft 120, preferably mutually engaged, and the carriage 90 is thus locked safely, stationary on column 8.

[0097] The apparatus according to the aforementioned embodiment, for the rest, is structurally and functionally completely similar to the previously described embodiment.

[0098] The apparatus described by the way of example may be modified according to the different requirements.

[0099] In the practical embodiment of the invention, the materials used, as well as the shape and dimensions may be modified according to the needs.

[0100] Should the technical features mentioned in any claim be followed by reference signs, such reference signs were included strictly with the aim of enhancing the understanding of the claims and hence they shall not be deemed restrictive in any manner whatsoever on the scope of each element identified for exemplifying purposes by such reference signs.

Claims

1. An apparatus for winding products with a film of winding material comprising a base frame (2), a rotating table (3) on which a product to be wound is provided, a motor member (4), said rotating table (3) being revolving around a vertical rotation axis upon activation of said motor member (4), a column (8) associated with said base frame (2), a dispensing device (7) configured to hold a reel (10) for feeding said winding material, slidable along said column (8), **characterised in that** it comprises a transmission unit (6, 60) configured to transform a rotary motion of a shaft (12, 120), rotated by said motor member (4), in a sliding motion of said dispensing device (7) along said column (8).

2. An apparatus as in claim 1, **characterised in that** it comprises a coupling device (17, 170) configured to control said translatory motion of said delivery device (7) according to a lifting or lowering direction.

3. An apparatus as in claim 2, **characterised in that** it includes a control member (21) connected to said coupling device (17, 170) for controlling the actuation of translational motion of said dispensing device (7) according to said lifting or lowering direction.

4. An apparatus as in claim 2 or 3, **characterised in that** said transmission unit (6, 60) comprises a first driving member (11, 110) and a second driving member (13, 130), rotated by said motor member (4), a first driven member (15, 150) and a second driven member (16, 160), said coupling device (17, 170) selectively actuating said first driven member (15, 150) or said second driven member (16, 160), a transformation device (22, 220), configured to transform the rotary motion selectively transmitted to said first driven member (15, 150) or to said second driven member (16, 160) into said translatory motion of sliding of said dispensing device (7).

5. An apparatus as in claim 4, **characterised in that** said first driving member (11, 110) and said second driving member (13, 130) are made by hubs keyed on said shaft (12, 120).

6. An apparatus as in claim 5, **characterised in that** said first driven member (15, 150) and said second driven member (16, 160) are made by idle pulleys keyed on said shaft (12, 120).

7. An apparatus as in claim 6, **characterized in that** said coupling device (17, 170) is made by means of a fork member, selectively movable, along said shaft (12, 120), on command of said control member (21), for coupling said first driven member (15, 150) with said first driving member (11, 110) or said second driven member (16, 160) with said second driving member (13, 130).

8. An apparatus as in claim 7, **characterised in that** it comprises elastic contrast means (20, 200) acting on said first driven member (15, 150) and said second driven member (16, 160) to cause the disengagement from said first driving member (11, 110) and said second driving member (13, 130) when said control member (21) is deactivated.

9. An apparatus as in any one of claims 6-8, **charac-**

terised in that each said driven member (15, 150, 16, 160) has a relative coupling toothing (19), turned, in use, towards the respective driving member (11, 110, 13, 130), each said driving member (11, 110, 13, 130) having a toothing (14) capable of meshing with said engagement toothing (19) so as to transmit the rotary motion.

10. An apparatus as in any one of claims 6-8, **characterised in that** it comprises a friction transmission device (300'), interposed between each said driving member (11, 110, 13, 130) and a related driven member (15, 150, 16, 160) to transmit the rotary motion.

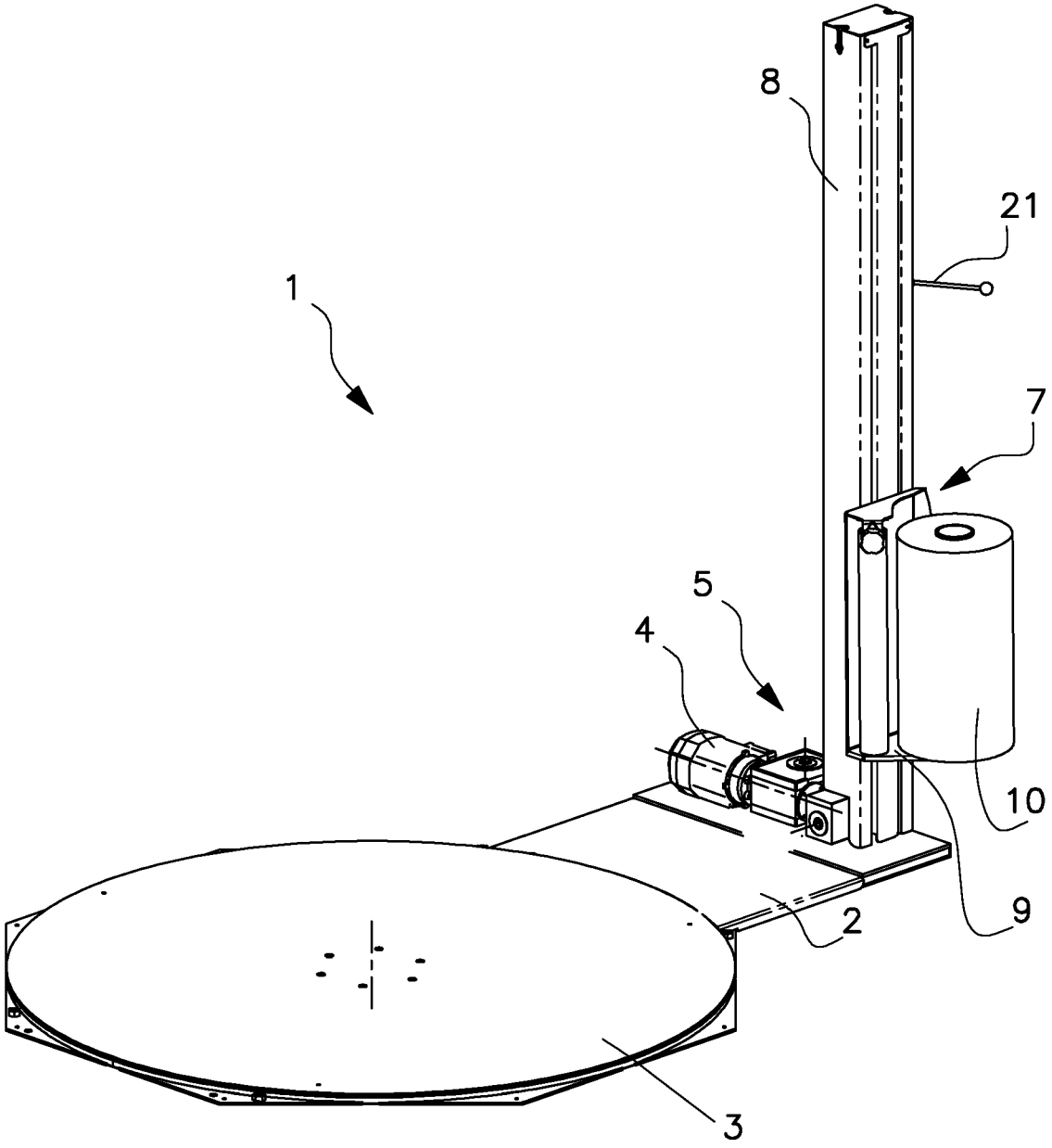

Fig.1

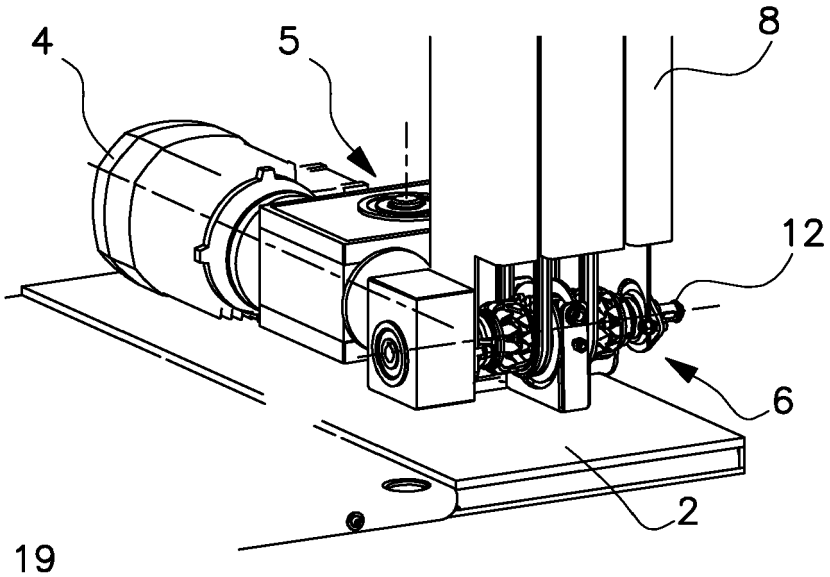

Fig.2

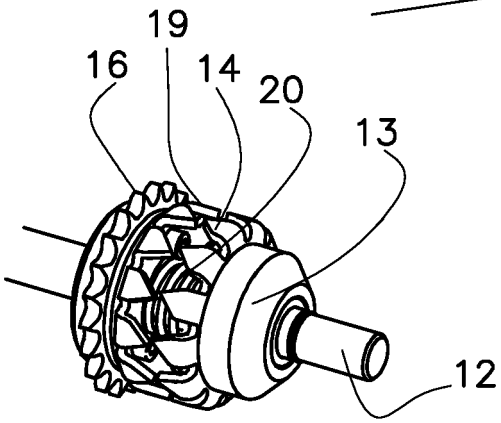

Fig.9

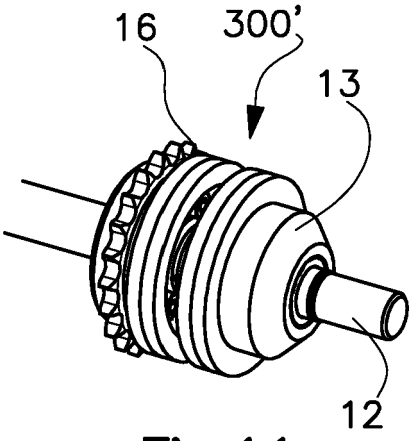

Fig.11

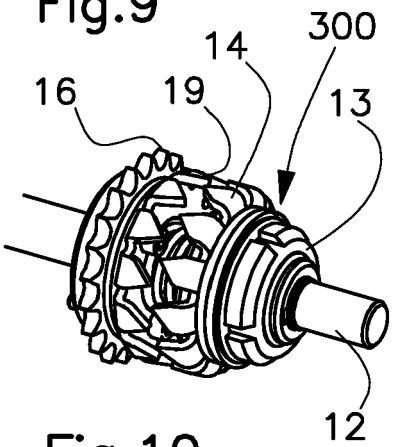

Fig.10

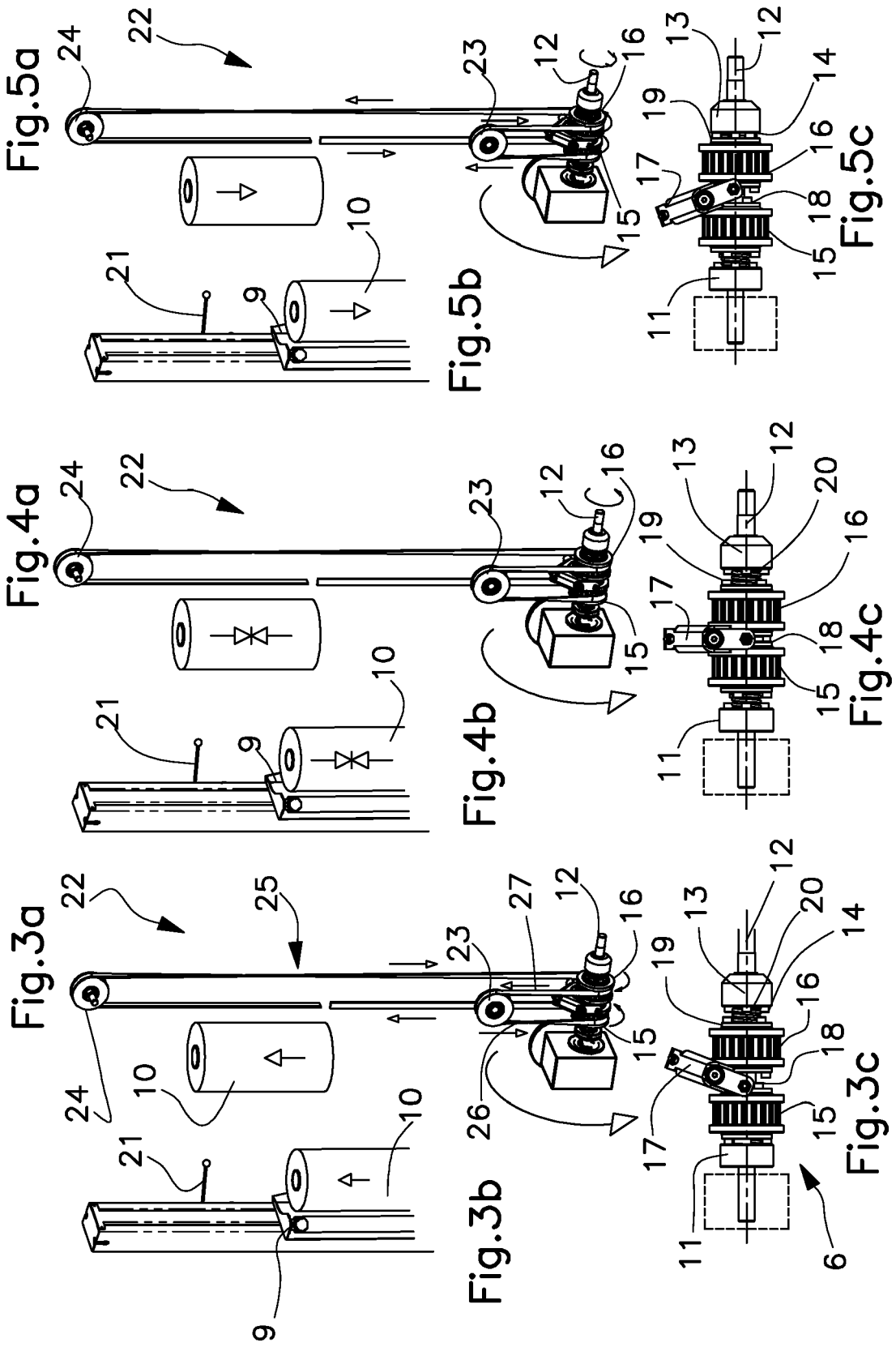
Fig.5a
Fig.5b
Fig.5c
Fig.4a
Fig.4b
Fig.4c
Fig.3a
Fig.3b
Fig.3c

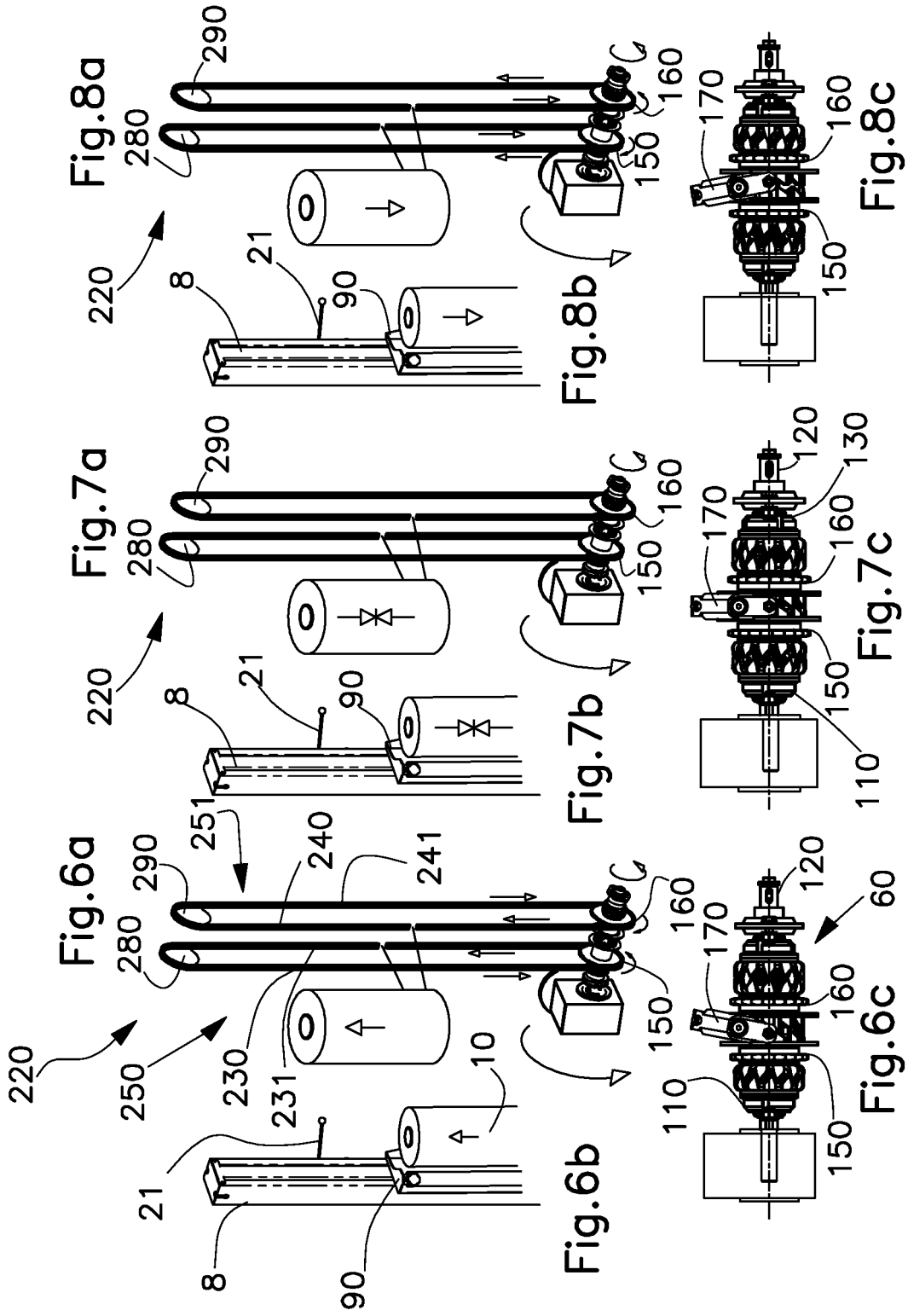
Fig.8a
290
280
220
21
8
90
Fig.8b
160
150
Fig.8c
170
160
150
Fig.7a
290
280
220
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8
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Fig.7b
160
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Fig.7c
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160
150
110
Fig.6a
251
290
240
241
280
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250
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Fig.6b
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Fig.6c
120
60
170
160
150
110

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EUROPEAN SEARCH REPORT

Application Number
EP 20 21 5598

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,D	EP 1 083 126 A1 (SEKISUI JUSHI KK [JP]) 14 March 2001 (2001-03-14) * Figures and description thereof *	1-10	INV. B65B11/04
A	US 2006/254214 A1 (COX BRUCE N [AU] ET AL) 16 November 2006 (2006-11-16) * Figures and description thereof *	1-10	
A	US 4 248 031 A (DEL POZO JR ALBERT J) 3 February 1981 (1981-02-03) * Figures and description thereof *	1-10	
A	WO 2018/220503 A1 (ROBOPAC S P A [SM]) 6 December 2018 (2018-12-06) * Figures and description thereof *	1-10	
A	EP 2 238 035 B1 (FROMM ITALIANA S R L [IT]) 24 July 2013 (2013-07-24) * Figures and description thereof *	1-10	
A	CA 1 069 039 A (SHULMAN MICHAEL H) 31 December 1979 (1979-12-31) * Figures and description thereof *	1-10	TECHNICAL FIELDS SEARCHED (IPC) B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 April 2021	Ngo Si Xuyen, G

CATEGORY OF CITED DOCUMENTS

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13-04-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1083126 A1	14-03-2001	DE 60006468 T2	26-08-2004
		EP 1083126 A1	14-03-2001
		US 6370839 B1	16-04-2002
US 2006254214 A1	16-11-2006	US 2004031238 A1	19-02-2004
		US 2006254214 A1	16-11-2006
		WO 0230751 A1	18-04-2002
US 4248031 A	03-02-1981	NONE	
WO 2018220503 A1	06-12-2018	BR 112019025200 A2	23-06-2020
		CN 110678396 A	10-01-2020
		EP 3630627 A1	08-04-2020
		US 2020180798 A1	11-06-2020
		WO 2018220503 A1	06-12-2018
EP 2238035 B1	24-07-2013	EP 2238035 A2	13-10-2010
		WO 2009087600 A2	16-07-2009
CA 1069039 A	31-12-1979	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1083126 A **[0004]**