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(54) **Folding and wrapping assembly for packaging machines**

(57) A folding and wrapping assembly (1) for packaging machines, which comprises an area (2) for introducing the product (P) with a portion of film (F) superimposed thereon, a pusher (3) for sending the product (P) onto a sliding table (4), respective members for folding the protruding edges of the portion of film (F), suitable

movable apparatuses for folding the end flaps (5), constituted by superimposed edges of the film (F), and at least one movable heat-sealing device. The movable apparatuses for folding the flaps (5) are able to slide along the surface of the product (P) to be packaged in order to tension the film (F) along it.

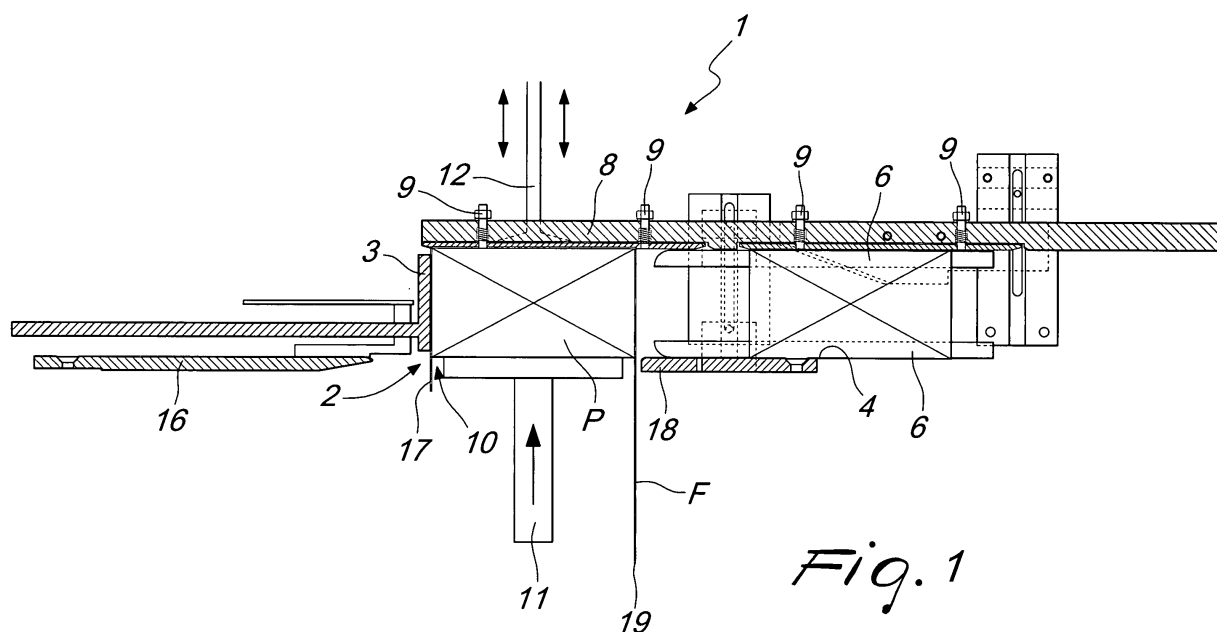


Fig. 1

Description

[0001] The present invention relates to a folding and wrapping assembly for packaging machines.

[0002] When it is necessary to package products which have a high price or are designed for customers who require a high quality level of the product (for example in sectors such as the cosmetic industry, the pharmaceutical industry, and the like), it is common practice to place the product inside the respective container (jar, bottle and others) and insert the container in a protective case.

[0003] These cases can be made of various materials: paper, cardboard, polymeric materials and combinations thereof are mainly used.

[0004] In order to prevent the cases from spoiling during transport and any stacking in storage, it is common practice to cover them with a sheet (or with multiple mutually associated sheets) of polymeric material: this is generally a heat-sealing polymeric film.

[0005] The best protection of the case is achieved by using films of substantial thickness which are scarcely deformable. For this reason, stretch films typically used in other fields of packaging are generally ruled out.

[0006] However, this type of material is particularly subject to permanent deformations (any folding leaves visible traces even if the film is flattened again, eliminating the fold), which of course can compromise the quality of the overall package.

[0007] In particular, known types of packaging machine adapted to wrap the film around a case have various problems which have a negative effect on the aesthetic characteristics of the overall package.

[0008] These machines fold the lateral flaps by moving the case (in practice a boxlike body), on which the film is pre-wrapped, in a tubular configuration, along its lateral surfaces, through folding devices of various kinds arranged on respective consecutive stations.

[0009] At the end of the consecutive folding stations there is at least one heat-sealing station, by means of which it is possible to mutually couple the overlapping flaps of the film so as to make the package stable.

[0010] Of course, the considerable longitudinal extension of the line that comprises the folding stations and the heat-sealing station (or stations) in any case comprises guides for conveying the sequence of products to be packaged with the film. The length of the guides (which are always in contact with the film and the product) and the presence of the folding devices and heat-sealing stations that make contact with the film causes considerable friction in the advancement of the products being packaged.

[0011] This leads to a high likelihood of disarrangement of the package (the film moves with respect to the case due to friction) or of forming creases or other irregularities which compromise its appearance.

[0012] The presence of many stations in sequence further makes the adjustment of the machine more complicated and forces long machine downtimes if one wishes

to change format.

[0013] Further, the presence of several stations forces great complexity in the management and manufacture of the respective movement members and is therefore particularly complex in terms of design, of the components required and of their association, and also in terms of installation and first activation.

[0014] The aim of the present invention is to provide a folding and wrapping assembly for packaging machines which has modest dimensions in order to avoid deformation of the package obtained with the film during its advancement along the machine.

[0015] Within this aim, an object of the present invention is to provide a folding and wrapping assembly for packaging machines which is easy to adjust and with which format changing is easy to perform and quick to provide.

[0016] Another object of the present invention is to provide a folding and wrapping assembly for packaging machines which is constituted by simple components which are actuated by means of a limited number of movement members in order to facilitate maintenance and installation.

[0017] Another object of the present invention is to provide a folding and wrapping assembly for packaging machines which has low costs, is relatively simple to provide in practice and is safe in application.

[0018] This aim and these and other objects, which will become better apparent hereinafter, are achieved by the present folding and wrapping assembly for packaging machines, **characterized in that** it comprises an area for introducing the product with a portion of film superimposed thereon, a pusher for sending the product onto a sliding table, respective members for folding the protruding edges of said portion of film, suitable movable apparatuses for folding the end flaps, constituted by superimposed edges of the film, and at least one movable heat-sealing device, said movable apparatuses for folding said flaps being able to slide along the surface of the product to be packaged in order to tension the film along it.

[0019] Further characteristics and advantages of the invention will become better apparent and evident from the following detailed description of a preferred but not exclusive embodiment of a folding and wrapping assembly for packaging machines, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a side view of a folding and wrapping assembly for packaging machines according to the invention, in a first step of its operation;

Figure 2 is a side view of a folding and wrapping assembly for packaging machines according to the invention, in a second step of its operation;

Figure 3 is a side view of a folding and wrapping assembly for packaging machines according to the invention, in a third step of its operation;

Figure 4 is a front view of a folding and wrapping assembly for packaging machines according to the

invention, in a first or second step of its operation;
 Figure 5 is a front view of a folding and wrapping assembly for packaging machines according to the invention, in a third step of its operation;
 Figure 6 is a top view of a folding and wrapping assembly for packaging machines according to the invention, in a first step of its operation;
 Figure 7 is a top view of a folding and wrapping assembly for packaging machines according to the invention, in a second step of its operation;
 Figure 8 is a top view of a folding and wrapping assembly for packaging machines according to the invention, in a third step of its operation.

[0020] With reference to the figures, the reference numeral 1 generally designates a folding and wrapping assembly for packaging machines.

[0021] The assembly 1 according to the invention constitutes an evident technical advancement with respect to the background art, since it allows to provide in a single processing station the closure of a film F (both below and at the two ends of the product) while, simultaneously or directly thereafter, the various overlapping parts of the film F are fixed by heat-sealing.

[0022] By way of this constructive choice, it is therefore possible to reduce significantly the stroke that must be performed by a product P in order to provide complete packaging with the film F.

[0023] Heat-sealing the film F in the same region in which the product P is wrapped therein ensures the possibility to achieve better final quality of the package and simultaneously avoids the need to keep in position the film F (by means of suitable components) on the product P for subsequent transfers, consequently allowing possible disarrangement of such package during the transfers of the product P.

[0024] Of course, all these constructive choices have the common consequence of reducing considerably the overall dimensions of the assembly 1 with respect to structures adapted to achieve similar results of the background art. Space occupation reduction is a characteristic of particular practical interest; it further allows to reduce space in the formation of packaging lines to be installed in industrial spaces in which other systems are already present and therefore the space available is particularly limited.

[0025] The folding assembly 1 comprises an area 2 for inserting the product P, on which a portion of film F is superimposed (as shown in Figure 1), a pusher 3 for sending the product P onto a sliding table 4, respective elements for folding the protruding edges of the portion of film F, suitable movable apparatuses for folding the end flaps 5, which are constituted by overlapping edges of the film F, and at least one movable heat-sealing device.

[0026] The movable apparatuses for folding the flaps 5 can slide along the surface of the product P to be packaged in order to tension the film F along it.

[0027] The movable apparatuses comprise at least one lamina 6 which is adapted to rest against the surface of the film F, which in turn is applied to the surface of the product P.

5 **[0028]** The lamina 6 is arranged proximate to a perimetric edge of the product P (in the accompanying figures, it can be seen that the reference edges, in that case, are the upper edge and the lower edge of the face arranged at the front, with respect to the direction of advancement along the assembly 1, of the product P).

10 **[0029]** The movable apparatuses also comprise at least one sliding plate 7: the plate 7 is arranged externally with respect to the lamina 6 (and therefore also with respect to the product P). This arrangement is necessary in order to ensure that the end flaps 5 are interposed correctly between each lamina 6 and the corresponding plate 7. By way of this structural arrangement, the sliding of the plate 7 produces the juxtaposition of the flaps 5 on the corresponding surface of the product P, while the lamina 6 retains its base to the corresponding perimetric edge. It is evident that if the plate 7 slides on the surface of the product P, arranging the flaps 5 along the surface thereof while the base of the flap 5 is kept in the correct position by means of the lamina 6, the arrangement of the flaps 5 in the configuration for closing the package is particularly stable and correct: accordingly, the resulting package has an improved appearance with respect to packages that can be obtained with known types of packaging machine, i.e., avoiding incorrect arrangements of the flaps 5 or the formation of creases, irregularities and/or lack of symmetry.

25 **[0030]** The folding members comprise suitable upper profiles 8, which are forced elastically against the upper surface of the product P being packaged.

30 **[0031]** The sliding of the product P along the sliding table 4 of the assembly 1 produces tension of the film F as a consequence of the friction of such film against the surface of the profiles 8 and the surface of the table 4. By keeping the product P, partially packaged with the film F, between the profiles 8 and the table 4 subjected to a slight pressure, better adhesion of the film F to the surface of the product P is ensured, and this ensures stretching of the film F on such surface and correct preservation of the mutual position between the film F and the product P.

35 **[0032]** The upper profiles 8 comprise adjustable pressers 9 for varying the elastic forcing of the profiles 8 on the surface of the product P to be packaged. In particular, the pressers 9 are constituted by threaded stems on which there is an axially-acting spring designed to keep the profiles 8 forced against the upper surface of the product P.

40 **[0033]** The area 2 for inserting the product P comprises a lower opening 10, which is arranged upstream of the sliding table 4 for the product P to be packaged.

45 **[0034]** A lifting unit 11 transfers the product P from a supply region arranged below the table 4. The portion of film F for packaging the product P is arranged between the supply region and the table 4, facing the opening 10.

[0035] In order to ensure the best possible locking of the product P and of the film F (and therefore constrain their mutual positioning), a vertical locking shaft 12 is also used which contrasts the lifting unit 11 to correctly clamp the product P wrapped in the film F.

[0036] The pusher 3 for sending the product on the sliding table 4 is arranged directly upstream of the area 2 for inserting the product P and comprises an actual pusher body (the one indicated specifically by the reference numeral 3 in the accompanying figures) and at least one respective folding member, which can slide along the lateral surface of the product P, gliding over the film F, in order to juxtapose it on the surface of the product P.

[0037] In particular, the sliding folding members are four, arranged according to two pairs 13, which are symmetrical with respect to the longitudinal axis of the assembly 1, of facing members 14 and 15.

[0038] The pair 13 comprises a movable contoured slider 14, which can slide with respect to the pusher body 3 to a configuration in which it overlaps it by a length which is substantially close to half the side of the face of the product P on which it works. The contour comprises an initial divaricated portion 25 for guiding the folding of the film F. The sliding of the slider 14 on the product P, in fact, arranges on the face of the product P the film F that protrudes laterally from the product P (since the film F is accompanied by the divaricated portion 25 until it is arranged so as to face and lie proximate to the face of the product P) to form the first flap 5.

[0039] The pair 13 also comprises a fixed contoured wing 15. The advancement of the product P to be packaged along the sliding table 4 by way of the action of the pusher body 3 produces the sliding contact of the contoured wing 15 against the surface of the face of the product P that faces it, consequently arranging thereon the film F (which is interposed between the product P and the wing 15) so as to protrude laterally from the product P to form the second flap 5.

[0040] A metallic base plate 16 is rigidly coupled to the pusher body 3, below it, and is substantially aligned with the base of the product P when it is supported by the lifting unit 11.

[0041] The metallic base plate 16, during advancement, which is matched by its sliding along the lower face of the product P, folds a portion 17 of the film F, which protrudes downward, juxtaposing it on the lower face of the product P.

[0042] The advancement of the product P to be packaged along the sliding table 4 by way of the action of the pusher body 3 produces the abutment of a front edge 18 of the sliding table 4 against one side of the lower face of the product P, with consequent folding of a second portion 19 of the film F, which protrudes downward, juxtaposing it against the lower face of the product P. In particular, the portion 17 and the portion 19 are partially superimposed when the folding of both is completed.

[0043] The movable heat-sealing devices comprise a stem 20, which is arranged downstream of the front edge

18 of the table 4 and can move from a first configuration, in which its heat-sealing surface is separated and distant from the surface of the sliding table 4 (as shown in Figure 2) to a second configuration, in which its heat-sealing surface is aligned, and optionally also protrudes very slightly, with respect to the surface of the sliding table 4 (as shown in Figure 3) for the mutual heat-sealing of the portions 17 and 19 of the film F which are partially superimposed.

[0044] The movable heat-sealing devices comprise oscillating arms 21 which are arranged downstream of the stem 20 and at the sides of the sliding table 4.

[0045] The arms 21 are provided, on their movable end, with at least one heated tooth 22; the arms 21 can oscillate from an inactive configuration, in which the tooth 22 is spaced from the corresponding surface of the product P (inactive configuration shown in Figure 4), to an active configuration, in which the tooth 22 rests on the flaps 5 of the film F which are superimposed for mutual heat-sealing (configuration shown in Figure 5).

[0046] According to an embodiment of particular interest in practice and in application, the movable heat-sealing devices 20 and 21, the sliding plate 7 and the pusher body 3 are connected, with the interposition of suitable gearmotors, levers and cams, to a single driving source: for example, they can all be moved by a suitably controlled electric motor.

[0047] In practice, the product P arrives from a lower region, transferred by the lifting unit 11, to the insertion area 2.

[0048] The pusher body 3 moves the product P toward the sliding table 4, while the metallic plate 16 arranges the portion 17 along the lower face of the product P. Simultaneously, the edge 18 folds in a similar manner the portion 19, superimposing it on the portion 17.

[0049] All these steps occur while the product P and the film F are mutually coupled by way of the pressure applied by the profiles 8. The product P reaches the "lateral folding devices", in which the lamina 6 locks at its base the corresponding flap 5 with respect to the product P and the sliding plate 7 folds and stretches the flap 5 of the film F on the face of the product P. This folding and stretching step occurs both above and below the product P, so that the two folded flaps 5 are partially superimposed.

[0050] At this point, the movement of the heat-sealing devices is started: in particular, this causes a rise of the stem 20 and a rotation of the arms 21 for supporting the teeth 22 from the inactive configuration (shown respectively in Figures 2 and 4) to the active heat-sealing configuration (shown respectively in Figures 3 and 5).

[0051] As a consequence of the thrust received from the products P that follow (the ones that must be packaged subsequently), each packaged product P is conveyed along the table 4 to an output station, where it can be removed.

[0052] It has thus been shown that the invention achieves the intended aim and objects.

[0053] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0054] All the details may further be replaced with other technically equivalent ones.

[0055] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0056] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0057] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0058] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

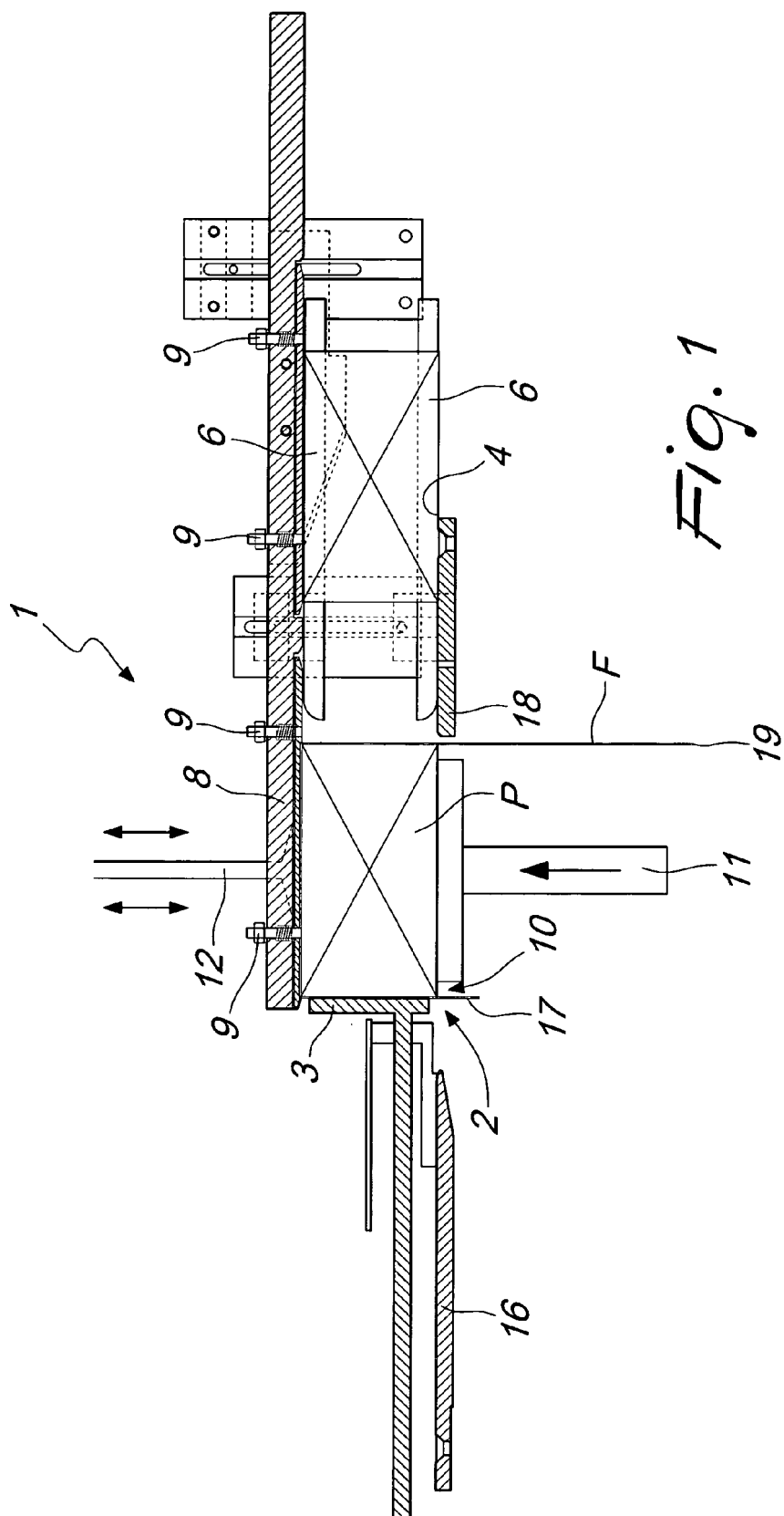
1. A folding and wrapping assembly for packaging machines, **characterized in that** it comprises an area (2) for introducing the product (P) with a portion of film (F) superimposed thereon, a pusher (3) for sending the product (P) onto a sliding table (4), respective members for folding the protruding edges of said portion of film (F), suitable movable apparatuses for folding the end flaps (5), constituted by superimposed edges of the film (F), and at least one movable heat-sealing device, said movable apparatuses for folding said flaps (5) being able to slide along the surface of the product (P) to be packaged in order to tension the film (F) along it.
2. The assembly according to claim 1, **characterized in that** said movable apparatuses comprise at least one lamina (6) which is suitable for resting against the surface of the film (F), which in turn is applied to the surface of the product (P), said lamina (6) being arranged proximate to a perimetric edge of said product (P), and at least one plate (7), which can slide externally to said lamina (6) with respect to said product (P), the end flaps (5) being interposed between said lamina (6) and said plate (7) and the sliding of said plate (7) producing the juxtaposition of the flaps (5) on the corresponding surface of the product (P) while said lamina (6) retains the base thereof to the corresponding edge.

3. The assembly according to claim 1, **characterized in that** said folding members comprise suitable upper profiles (8) which are forced elastically onto the upper surface of the product (P) being packaged, the sliding of the product (P) along said sliding table (4) of said assembly (1) determining a tension of the film (F) as a consequence of its friction against the surface of said profiles (8) and the surface of said table (4).
4. The assembly according to claim 3, **characterized in that** said upper profiles (8) comprise pressers (9) which are adjustable in order to vary the elastic forcing of said profiles (8) on the surface of said product (P) to be packaged.
5. The assembly according to claim 1, **characterized in that** said area (2) for inserting the product (P) comprises a lower opening (10), which is arranged upstream of said sliding table (4) for said product (P) to be packaged, and a lifting unit (11) for transferring the product (P) from a supply region arranged below said table (4), the portion of said film (F) for packaging said product (P) being arranged between said insertion area (2) and the table (4), which faces said opening (10).
6. The assembly according to claim 1, **characterized in that** said pusher (3) for sending the product (P) on a sliding table is arranged directly upstream of said area (2) for insertion of the product (P) and comprises an actual pusher body (3) and at least one respective folding member, which can slide along the surface of the product (P), touching said film (F), in order to juxtapose it on the surface of the product (P).
7. The assembly according to the preceding claim, **characterized in that** said sliding folding members are four, arranged in two pairs (13), symmetrical with respect to the longitudinal axis of the assembly (1), of facing elements (14, 15).
8. The assembly according to claim 7, **characterized in that** each one of said pairs (13) comprises a contoured slider (14) which can move and slide with respect to said pusher body (3) to a configuration in which it overlaps it by a length which is substantially close to half the side of the face of the product (P) on which it works, said contour comprising an initial divaricating portion (25) for guiding the folding of the film (F), the sliding of the slider (14) on the product (P) producing the arrangement, on the face of the product (P), of the film (F) which protrudes laterally from the product (P) to form a first flap (5).
9. The assembly according to claim 7, **characterized in that** each one of said pairs (13) comprises a fixed

contoured wing (15), the advancement of the product (P) to be packaged along said sliding table (4) by way of the action of said pusher body (3) producing the sliding contact of said contoured wing (15) on the surface of the face of the product (P) that faces it, with consequent arrangement thereon of the film (F) which protrudes laterally from the product (P) to form a second flap (5).

10. The assembly according to one or more of the preceding claims, **characterized in that** a metallic base plate (16) is rigidly coupled to said pusher body (3) below it and is substantially aligned with the base of said product (P), when supported by said lifting unit (11), said metallic base plate (16), during advancement, with corresponding sliding along the lower face of the product (P), folding a portion (17) of the film (F) which protrudes downward, juxtaposing it on the lower face of said product (P).
11. The assembly according to one or more of the preceding claims, **characterized in that** the advancement of the product (P) to be packaged along said sliding table (4) by way of the action of said pusher body (3) produces the abutment of the front edge (18) of the sliding table (4) against a side of the lower face of the product (P), with consequent folding of a portion (19) of the film (F) which protrudes downward, juxtaposing it on the lower face of said product (P).
12. The assembly according to claims 1, 10 and 11, **characterized in that** said movable heat-sealing devices comprise a stem (20), which is arranged downstream of said front edge (18) of the table (4) and can move from a first inactive configuration, in which its heat-sealing surface is separated and distant from the surface of the sliding table (4), to a second active configuration, in which its heat-sealing surface is aligned, optionally also slightly protruding, with respect to the surface of the sliding table (4), for mutual heat-sealing of said portions (17, 19) of film (F) partially superimposed earlier by way of the action of the front edge (18) of the sliding table (4) and of the metallic base plate (16).
13. The assembly according to one or more of the preceding claims, **characterized in that** said movable heat-sealing devices comprise oscillating arms (21), which are arranged downstream of said stem (20) and to the sides of said sliding table (4), said arms (21) being provided on their movable end with at least one heated tooth (22), said arms (21) being able to oscillate from an inactive configuration, in which said tooth (22) is spaced from the corresponding surface of the product (P), to an active configuration, in which said tooth (22) rests against said flaps (5) of the film (F) which are superimposed for mutual heat-sealing.

14. The assembly according to one or more of the preceding claims, **characterized in that** said movable heat-sealing devices (20, 21), said sliding plate (7) and said pusher body (3) are connected to a single driving source with the interposition of suitable gear-motors, levers and cams.



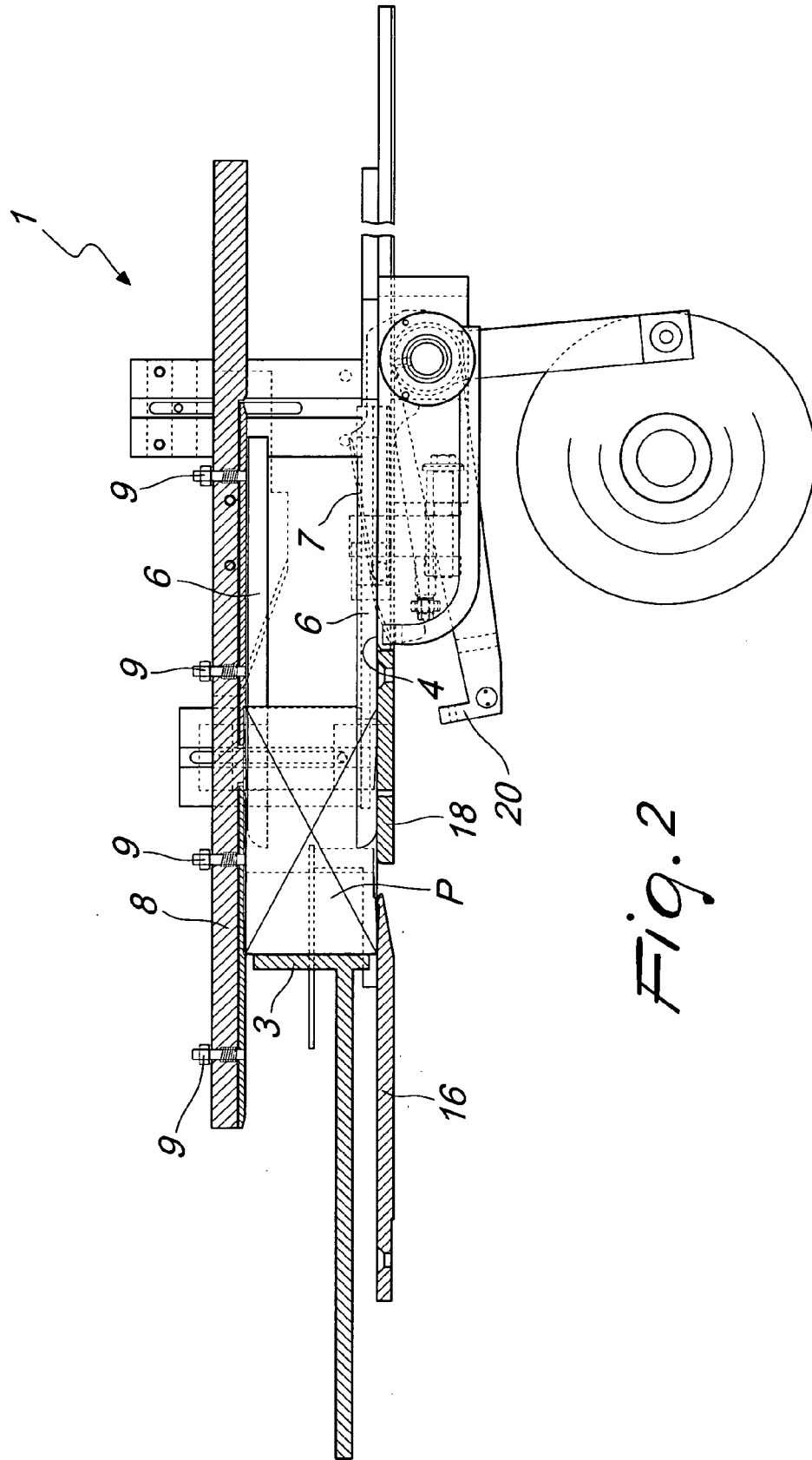


Fig. 2

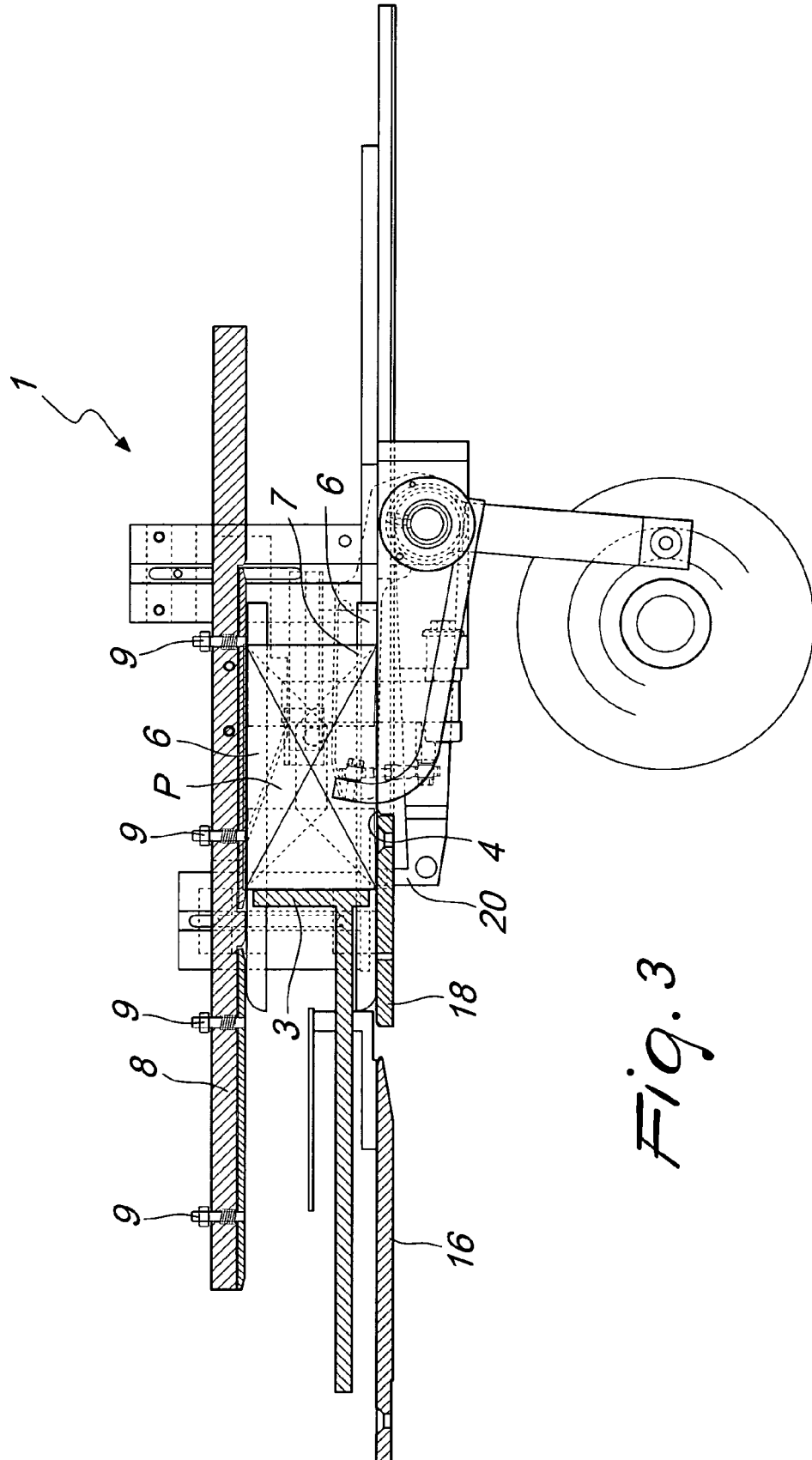
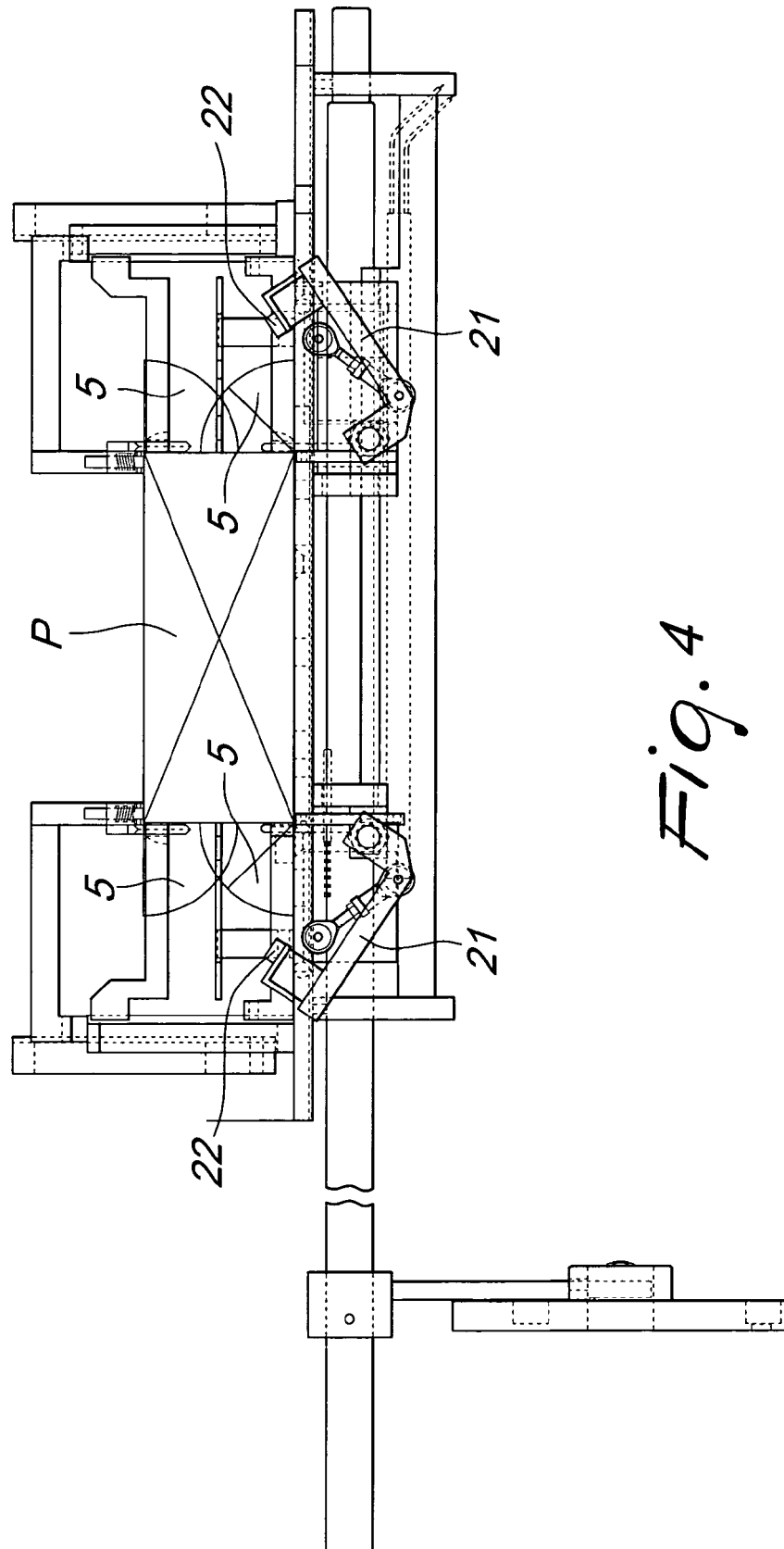


Fig. 3



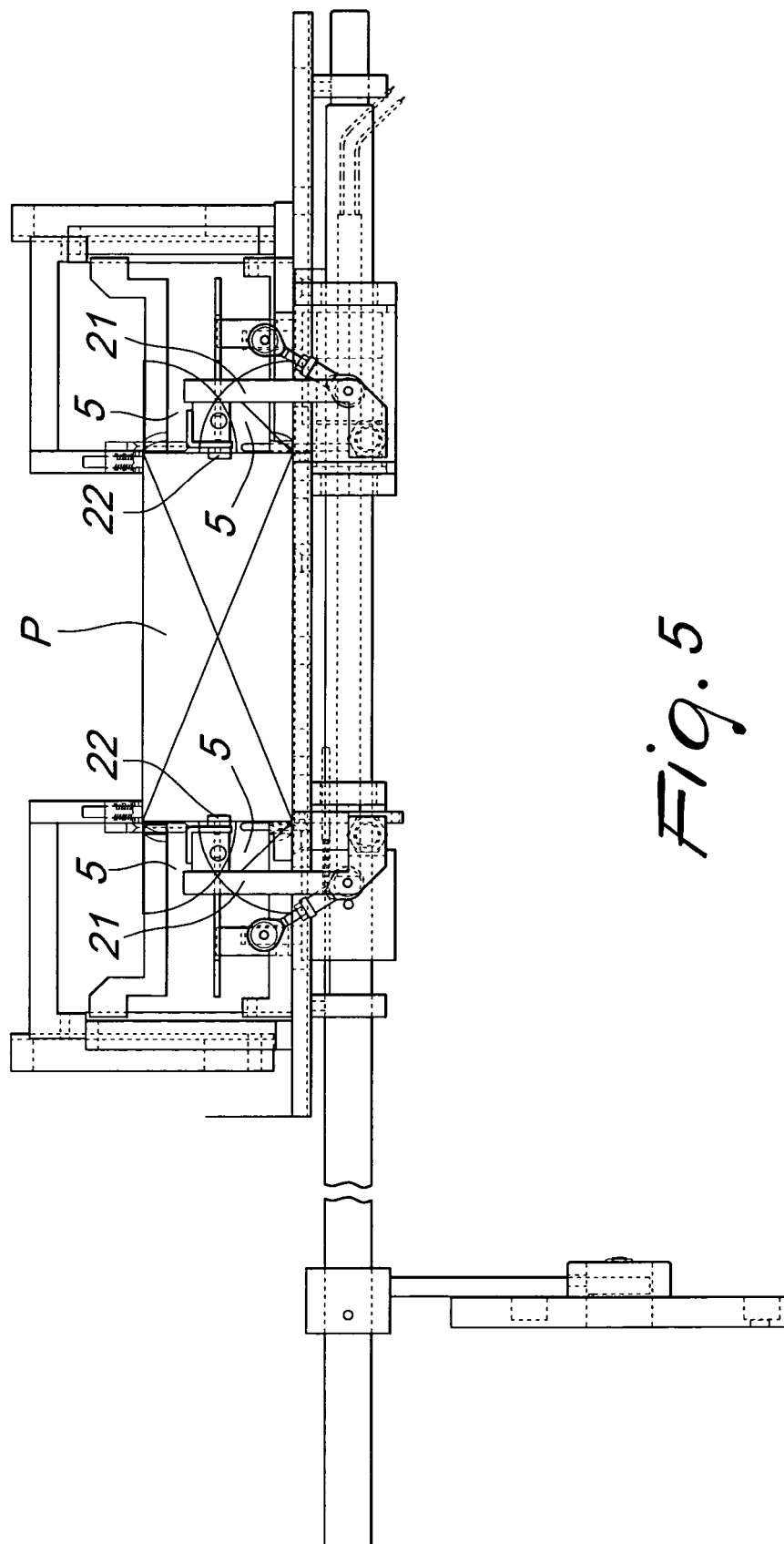
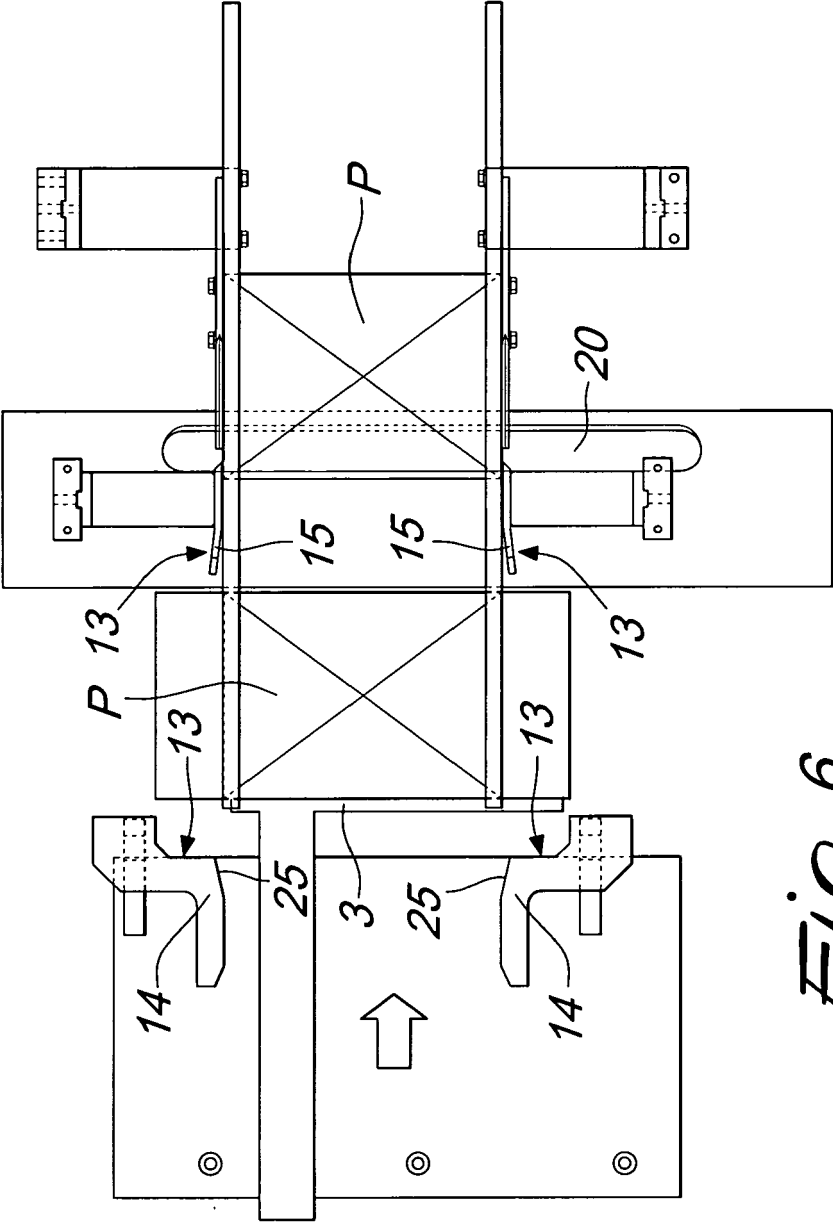
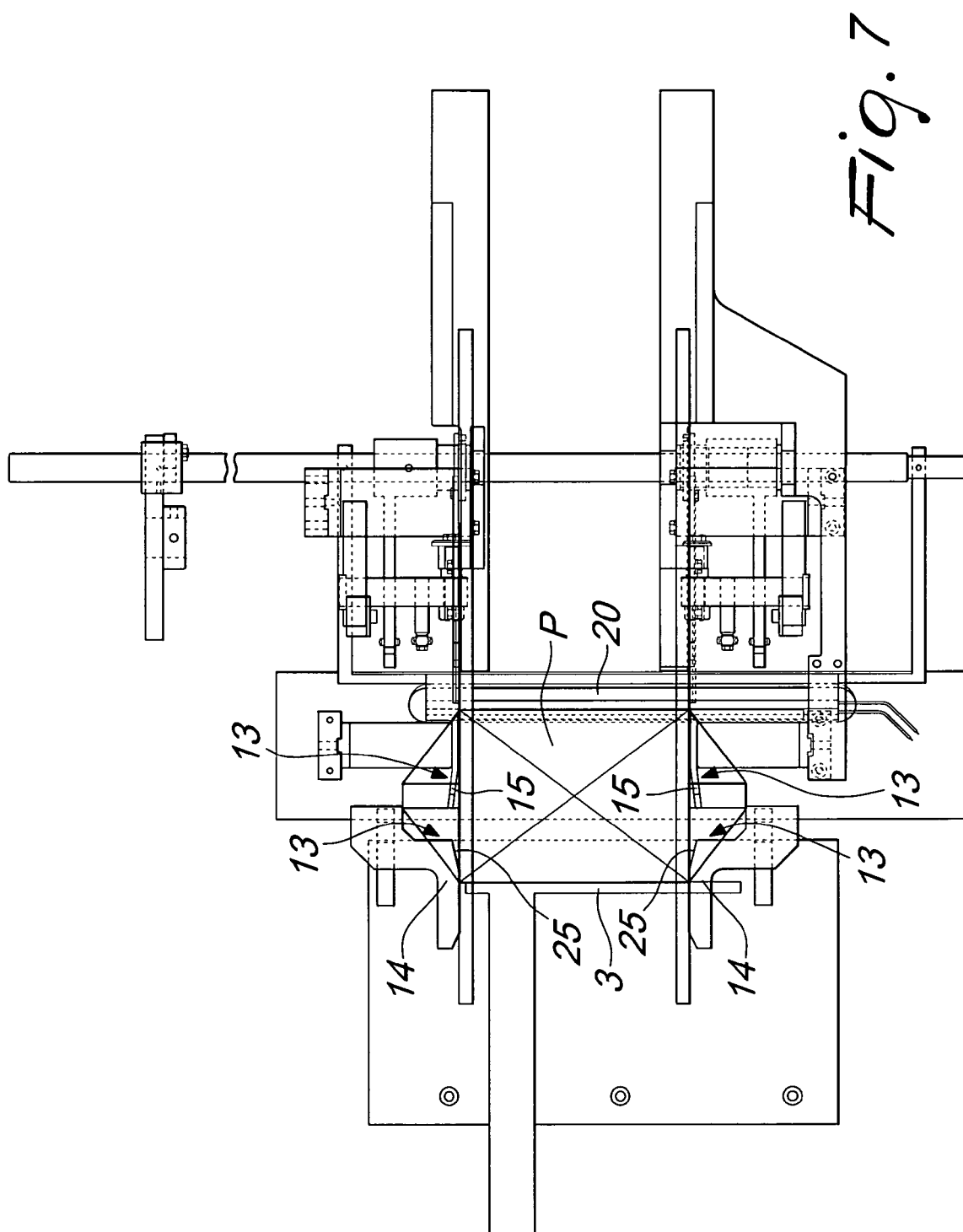


Fig. 5





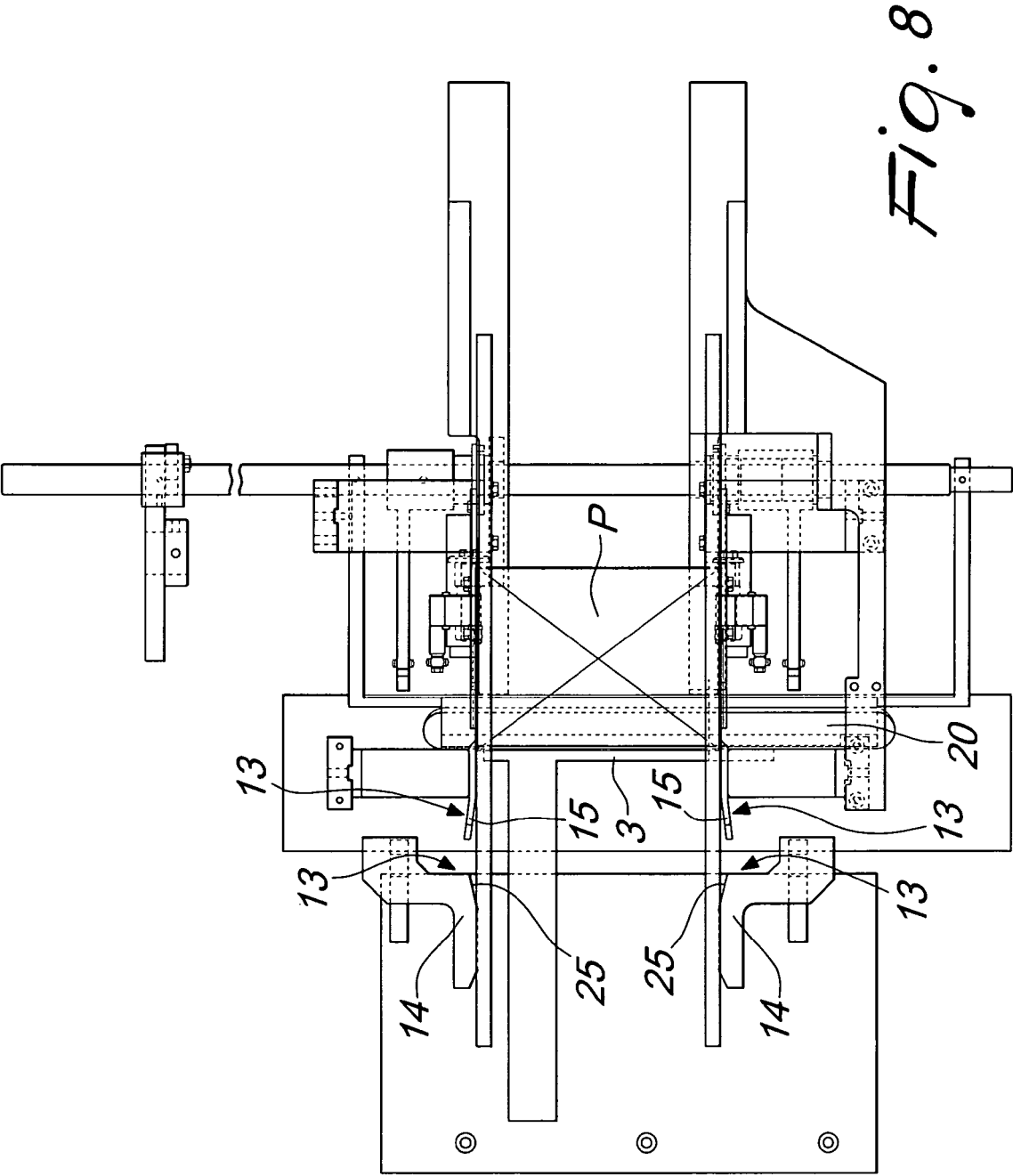


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5282

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 4 098 057 A (HOLCOMB GREGORY W) 4 July 1978 (1978-07-04) * the whole document *	1-11	INV. B65B11/22 B65B51/14
Y	GB 911 273 A (DROHMANN GMBH C) 21 November 1962 (1962-11-21) * page 2, lines 89-108; figures 1,2 *	1-11	
A	DE 15 86 015 A1 (DROHMANN GMBH C) 21 May 1970 (1970-05-21) * page 9, line 1 - page 10, line 8; figure 2 *	1	
A	US 3 600 875 A (BUOB ROBERT KONRAD ET AL) 24 August 1971 (1971-08-24) * the whole document *	1	
----- The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) B65B
Place of search		Date of completion of the search	Examiner
Munich		26 September 2008	Schelle, Joseph
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

4

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 08 42 5282

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-11

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 08 42 5282

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-11

Folding and wrapping assembly

2. claims: 12,13

Heat sealing devices

3. claim: 14

Driving source

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

EP 08 42 5282

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-09-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4098057	A	04-07-1978	NONE	
GB 911273	A	21-11-1962	CH 390776 A DE 1114433 B	15-04-1965 28-09-1961
DE 1586015	A1	21-05-1970	NONE	
US 3600875	A	24-08-1971	NONE	