

(19)



(11)

EP 2 607 243 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
04.06.2014 Bulletin 2014/23

(51) Int Cl.:
B65B 9/213 (2012.01) **B65B 9/207** (2012.01)
B65B 9/20 (2012.01)

(21) Application number: **11195078.8**

(22) Date of filing: **22.12.2011**

(54) Filling machine

Füllvorrichtung

Machine de remplissage

(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**

(43) Date of publication of application:
26.06.2013 Bulletin 2013/26

(73) Proprietor: **Boato Pack S.r.L. a Socio Unico
34079 Staranzano (GO) (IT)**

(72) Inventors:
• **Di Fede, Adriano
34079 Staranzano (Gorizia) (IT)**

• **Prodan, Roberto
34074 Monfalcone (Gorizia) (IT)**
• **Bertogna, Valentino
34075 San Canzian d'Isonzo (Gorizia) (IT)**

(74) Representative: **Lunati & Mazzoni S.r.L.
Via Carlo Pisacane, 36
20129 Milano (IT)**

(56) References cited:
**GB-A- 2 311 759 JP-A- 2006 089 136
US-A- 6 006 501 US-A1- 2003 089 421
US-A1- 2003 093 971**

EP 2 607 243 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a filling machine of the type pointed out in the preamble of the first claim.

[0002] Presently known are filling machines adapted to produce sealed packages having various contents. In particular, the filling machines form a plurality of bags and sachets in sequence starting from a packing sheet and the loose product.

[0003] A similar machine is described in patent application US-A-6006501.

[0004] Most of the filling machines operate as follows.

[0005] A packing sheet is placed close to the machine and starting from this sheet wound up into a reel the bags or sachets will be made. The sheet is unrolled and conveyed to a forming and sealing apparatus. Along this apparatus the sheet is wrapped on a tube having a transverse axis relative to the major extension direction of the sheet and a circumference slightly smaller than the sheet width. The advancing sheet portions wrapped along the tube are mutually joined and sealed. It is therefore a seal in the longitudinal direction relative to the major extension direction of the sheet.

[0006] Subsequently the longitudinally sealed sheet extends beyond the tube along which it is wrapped and is sealed transversely. The transverse seal is cut in the middle so that the transverse seal acts as head sealing for one bag and bottom sealing for the following bag. In addition, the bag that has received the bottom sealing is filled with the product in such a manner that the product remains inside the bag when the head sealing has been carried out.

[0007] During this process unrolling of the sheet is carried out by the transverse sealing device that, while it is grasping the two opposite flaps of the wrapped sheet for mutually sealing them, drives the same in the unrolling direction.

[0008] Thanks to these filling machines most of the objects of any size are sacked, from the single-dose condiment-containing sachets of a width less than one centimetre, to the earth-holding bags more than one metre wide. In addition, in order to improve productivity of the filling machines, multitrack filling machines have been produced.

[0009] In these machines the sheet wound up on a reel is divided, in the longitudinal direction, into a plurality of sheets or ribbons, each of which is adapted to make a series of bags. Several bags in parallel are therefore produced and the process is greatly speeded up.

[0010] The known art mentioned above has some important drawbacks.

[0011] In fact, the multitrack filling machines are not adapted to unroll sheets of great overall width, exceeding some tens of centimetres, for example. This drawback is due to the fact that high stresses and friction are created between the sheet and the sheet conveying and driving apparatus so that the tension on the different sheet por-

tions cannot be maintained to a constant level. Thus the multitrack filling machines can only produce sachets of a very reduced width, the so-called "sticks", and in addition a reduced number of tracks in parallel can be provided.

[0012] A further drawback resides in that the sachets that in parallel come out of the multitrack filling machines are in tight contact with each other. Thus particular sealing or forming elements for the bags cannot be placed close to the multitrack filling machines due exactly to the lack of space between the bags. Under this situation the technical task underlying the present invention is to provide a multitrack filling machine capable of substantially obviating the mentioned drawbacks.

[0013] Within the scope of this technical task, it is an important aim of the invention to obtain a multitrack filling machine capable of operating with sheets of great width and therefore adapted to produce, in parallel, either several bags of great width or a great number of bags of reduced width.

[0014] Another important aim of the invention is to make available a multitrack filling machine provided with particular sealing or forming elements for the bags.

[0015] The technical task mentioned and the aims specified are achieved by a multitrack filling machine according to the characterising portion of independent claim 1.

[0016] Preferred embodiments are highlighted in the independent claims 2-8. The features and advantages of the invention are hereinafter clarified by the detailed description of a preferred embodiment of the invention, with reference to the accompanying drawings, in which:

Fig. 1a shows a front view of a four-track filling machine according to the invention;

Fig. 1b shows a top view of a four-track filling machine according to the invention;

Fig. 2a is a front view of a six-track filling machine according to the invention;

Fig. 2b is a top view of a six-track filling machine according to the invention;

Fig. 3 is a top view of a variant of a filling machine according to the invention;

Fig. 4 reproduces a detail of the filling machine according to the invention;

Fig. 5 diagrammatically shows a bag obtained by use of the filling machine according to the invention.

[0017] With reference to the drawings, the multitrack filling machine according to the invention is generally identified by reference number **1**.

[0018] It is adapted to form closed bags **50** from a plurality of packing ribbons or strips **51** suitably formed by longitudinally cutting a single packing sheet **57** wound up on a reel **58**.

[0019] Each packing ribbon **51** defines a longitudinal direction **52** and a transverse direction **53** perpendicular to said longitudinal direction **52**.

[0020] In particular, the filling machine 1 is adapted to make closed bags 50 formed with a transverse portion of packing ribbon 51 folded over upon itself in the longitudinal direction 52 in such a manner that two longitudinal flaps 54 of the transverse portion are mutually superposed and sealed and that the lower 55 and upper 56 edges of the bag 50 are mutually sealed, as shown in Fig. 5. The filling machine 1 briefly comprises conveying means 2 and a plurality of sacking stations 3 each including: forming means 4, sealing means 5, filling means 6, cutting means 7 and driving means 8.

[0021] In greater detail, the conveying means 2 defines an unrolling trajectory for the packing ribbons 51, in a manner adapted to supply each sacking station 3 with a packing ribbon 51, along an advancing or feeding direction.

[0022] Said means comprises a reel-unrolling unit 9, preferably structurally independent of the rest of the machine. It is adapted to move reels 58 having large diameters and widths, diameters even exceeding one meter and widths larger than 1.25 metres, for example. Therefore unit 9 is able to provide a long period of self-government by greatly increasing the time intervening between two reel changes, and consequently the efficiency of the machine itself.

[0023] The reel-unrolling unit 9 preferably comprises a reel-carrying axis 9a actively actuated by a servomotor, operated based on the information of sensors measuring the reel 58 diameter.

[0024] Unit 9 further comprises a roller assembly 9c consisting of a plurality of movable conveying rollers and adapted to accumulate the packing sheet 57 waiting for processing and to adjust tension thereof.

[0025] The reel-unrolling unit 9 further comprises longitudinal-cutting knives 9d adapted to longitudinally divide the packing sheet 57 into a plurality of packing ribbons 51, preferably four or six ribbons 51.

[0026] The reel-unrolling unit 9 finally comprises a pair of opposite powered pulling rollers 9e substantially forming a calender. Said rollers 9e preferably have a high-friction surface, made of elastomer for example, and are adapted to ensure control in conveying the ribbons 51 downstream of the reel-unrolling unit 9. The conveying means 2 further comprises a deviation unit 10, downstream of the reel-unrolling unit 9. The deviation unit 10 comprises deviating devices 10b consisting of rollers or bars oriented at 45° relative to the exit direction of ribbons 51 from the reel-unrolling unit 9 and adapted to deviate ribbons 51 through a right angle. In particular a deviating device 10b is present for each ribbon 51.

[0027] Furthermore, alongside each deviating device 10b there are rollers 10a movable along the unrolling trajectory of the deviated ribbon 51, for fine adjustment of the path length of the packing ribbon 51.

[0028] The conveying means 2 finally preferably comprises tensioning rollers 11 placed in the vicinity of stations 3. They preferably have an outer surface of high friction, in particular made of elastomer or the like. Fur-

thermore, they are able to detect the tension of ribbon 51, as better specified in the following.

[0029] Disposed downstream of the conveying means there are the sacking stations 3 preferably of same number as the number of ribbons 51.

[0030] The sacking stations 3 preferably mainly extend in the vertical direction. The longitudinal direction of ribbon 51 in this portion of the machine 1 is therefore suitably coincident with the vertical direction. Each sacking station 3 first of all comprises forming means 4 for the packing ribbon 51. This means is adapted to fold one transverse portion of one of ribbons 51 along the longitudinal direction 52, in such a manner that the two longitudinal flaps 54 of the transverse portion of ribbon 51 are superposed.

[0031] The forming means 4 suitably comprises a collar 12 known by itself and consisting of a surface along which ribbon 51 is disposed for running inside a short portion of an underlying tube.

[0032] Collar 12 is followed by a forming tube 13 around which ribbon 51 is disposed, fully wrapping it in the circumferential direction, leaving the two longitudinal flaps 54 unwrapped around the circumference and mutually opposite.

[0033] Disposed downstream of the forming means 4 is the sealing means 5. This means comprises a longitudinal sealing device 14 adapted to seal the two superposed longitudinal flaps 54. This device 14 suitably carries out sealing by heat. In particular it comprises a heated portion adapted to be moved by suitable movement means, so as to come into contact with the two flaps 54. It is suitably provided with temperature control and pneumatic movement means, independent for each individual station 3. It can further comprise pulse sealing means, i.e. through electric heating.

[0034] The sealing means 5 also comprises a transverse sealing device 15 adapted to seal the ribbon 51 in the transverse direction 53 at given longitudinal space intervals. This device 15 too suitably carries out sealing by heat supply. In particular it comprises a series of opposite bars, heated preferably by independent heating, disposed after the forming tube 13 and adapted to be moved by suitable movement means, so as to come into contact with the two longitudinally-sealed opposite portions. It is suitably disposed on a single support for all stations 3. It can further comprise pulse sealing means, i.e. through electric heating.

[0035] Also disposed at the transverse sealing device 15 can be a bag shaping device 50 consisting of a known device for making a square bottom or the like, for example.

[0036] Stations 3 then comprise filling means 6 (Fig. 1a), which means is adapted to fill an open bag with the intended products, i.e. a bag that has been submitted to the longitudinal and transverse seals, the latter constituting the bag bottom, and has the upper portion open. The filling means 6 is known by itself and introduces the products through collar 12 and the forming tube 13.

[0037] Stations 3 also comprise cutting means 7 downstream of the sealing means 5 of ribbon 51. This means preferably consists of two opposite cutters and divides the bags 50 at the sealing in the transverse direction so that said sealing in the transverse direction constitutes the lower edge 55 of the open bag to be then filled and the upper edge 56 of the bag 50 made in the preceding space interval of ribbon 51.

[0038] Finally, each sacking station 3 advantageously comprises driving means 8 for ribbon 51. This driving means 8 is separated from the sealing means 5 and comprises a dragging surface 16 of high friction, preferably made of elastomer or the like, adapted to interact by contact with ribbon 51 and to drag the latter along in the feeding direction.

[0039] In particular the driving means 8 is disposed between the forming means 4 and cutting means 7. In more detail, this means is preferably disposed at the forming tube 13, in such a manner that the dragging surface 16 comes into contact with the ribbon 51 in turn wrapped on tube 13. The driving means 8 is shown in Fig. 4 and preferably consists of crawler tracks 17 driven by wheels 18. The outer surface of the tracks constitutes therefore the dragging surface 16. Tracks 17 preferably have a surface layer of elastomer and more particularly of natural rubber, and a toothed inner layer of stiffer and stronger material.

[0040] Tracks 17 preferably have width included between 1 cm and 3 cm and are wrapped around an angular portion of the forming tube 13 included between 20° and 30°; their thickness is included between 2 mm and 1 cm and the length is included between 30 cm and 80 cm.

[0041] The driving means 8 of each individual station 3, according to an innovative process, can be further suitably adjusted in an independent manner as a function of the tension of the individual ribbon 51, and each track 17 is preferably set in motion by a single servomotor. The machine 1 further comprises tension sensors 19 for the individual ribbons 51, adapted to check the tension of said individual ribbons 51. They can be disposed at the tensioning rollers 11 for example and consist of sensors adapted to check the vertical displacements of said rollers 11. Alternatively, they can consist of optical reading means or other means known by itself. Operation of a multitrack filling machine 1 described above as to its structure is the following.

[0042] The machine 1 preferably moves ribbon 51 with alternate pauses. First of all, the reel-unrolling unit 9 unrolls a portion of reel 58 and feeds the roller assembly 9c, in turn feeding the remaining portion of the machine 1. Activation of the roller assembly 9c takes place through unrolling of reel 58 by a servomotor moving axis 9c, taking into account the information both from sensors placed on the roller assembly 9c and from a sensor measuring the diameter of reel 58.

[0043] The packing sheet 57 is then unrolled, separated into ribbons by knives 9d and conveyed to the pulling rollers 9e. Each ribbon corresponds therefore to a track

comprising a station 3.

[0044] From the pulling rollers 9e onwards, unrolling of ribbons 51 is suitably timed with the operations of stations 3. In particular, in a movement step, ribbons 51 are moved towards stations 3. In detail, the driving means 8 is simultaneously activated on all tracks 3, each crawler track 17 receiving motion from a single servomotor. Simultaneously, the pulling rollers 9e are suitably activated by a servomotor. In particular, the pulling rollers 9e and driving means 8 are connected in an electric axis so that ribbons 51 are simultaneously dragged along by the roller assembly 9c.

[0045] In the portion between the driving means 8 and pulling rollers 9e, the individual ribbons 51 are dragged along, being compensated in position by rollers 10a and deviated by the deviating devices 10b; subsequently they pass through the tensioning rollers 11 and reach stations 3. In particular, deviation of ribbons 51 enables stations 3 to be disposed at arbitrary mutual distances. Therefore said stations enable the aforesaid shaping device or driving 8 and sealing devices 15 with said "square bottom" to be introduced.

[0046] Consequently, each ribbon 51 enters its own station 3. At each station 3 each ribbon 51 passes through the forming means 4 and takes the shape required for the subsequent sealing step through the sealing 5 and cutting 7 means.

[0047] In addition, in the portion in question, tension of the packing material is controlled by adjusting the speed ratio between the driving means 8 and the pulling rollers 9e.

[0048] When the movement step has been completed a pause step begins. Ribbons 51 are therefore stationary, the longitudinal sealing devices 14 are operated by a pneumatic movement for coming into contact with ribbons 51 and carrying out the longitudinal seal.

[0049] Simultaneously, the transverse sealing device 15 is operated by a servomotor for coming into contact with the packing ribbon 51 and carrying out the transverse sealing.

[0050] Still simultaneously, the cutting means 7 is driven by the servomotor and carries out the simultaneous cut lengthwise in all stations 3. Suitably, in this step also the measuring process for the product to be packaged by the filling means 6 takes place.

[0051] The invention comprises a new process for material sacking or for operating multitrack filling machines 1. The process contemplates the above disclosed operation.

[0052] The invention enables important advantages to be achieved.

[0053] In fact the machine, due to the presence of the particular driving means 8 is able to use and work also sheets of important width, exceeding 1.25 m for example, with great ability.

[0054] Consequently this machine 1 can make closed bags 50 that are very large or a great number of bags 50 in parallel, therefore greatly improving productivity, as

productivity in the examples shown is four and six times higher than in known machines.

[0055] The quality of bags 50 obtained in the individual stations 3 is ensured by the tension control that is independent in each track.

[0056] In addition, since the ribbons are deviated, according to the two configurations shown (Fig. 1b and Fig. 3), stations 3 can be spaced apart and bulky elements can be introduced, as previously said.

[0057] The invention is susceptible of variations falling within the inventive idea defined by the independent claims. All of the details can be replaced by equivalent elements and the materials, shapes and sizes can be of any nature and magnitude.

Claims

1. A multitrack filling machine (1) adapted to obtain closed bags (50) from a plurality of packing ribbons (51), each of said packing ribbons (51) defining a longitudinal direction (52) and a transverse direction (53) perpendicular to said longitudinal direction (52), said packing machine (1) comprising a plurality of sacking stations (3), each including: forming means (4) for said packing ribbon (51) adapted to fold a transverse portion of one of said packing ribbons (51) along a longitudinal direction (52), in a manner adapted to superpose two longitudinal flaps (54) of said transverse portion of said packing ribbon (51), sealing means (5) adapted to seal said two superposed longitudinal flaps (54) and seal said packing ribbon (51) in the transverse direction (53), at given space intervals, filling means (6) to fill an open bag formed with said packing ribbon (51) longitudinally and transversely sealed, in such a manner that said transverse seal constitutes the bottom of said open bag, cutting means (7) to cut said packing ribbon (51) at said seal in the transverse direction, in such a manner that said seal in the transverse direction constitutes the bottom of said open bag and the head closure of the one closed bag (50) obtained in the previous space interval of packing ribbon (51), driving means (8) for said packing ribbon (51) separated from said sealing means (5), said filling machine (1) further comprising conveying means (2) for said plurality of packing ribbons (51) adapted to convey said packing ribbons (51) along an unrolling trajectory and an advancing or feeding direction in a manner adapted to supply each of said packing stations (3) with one of said packing ribbons (51), **characterised in that** said driving means (8) includes a high-friction dragging surface (16) adapted to interact by contact with said ribbon (51) and drive it in the advancing direction, **in that** said driving means (8) of said different sacking stations (3) are adjustable in an independent manner as a function of the tension of the individual ribbon (51), and **in that** it comprises ten-

sion sensors (19) for the individual ribbons (51), adapted to measure the tension of said individual ribbons (51).

2. A machine as claimed in claim 1, wherein said driving means (8) comprises crawler tracks (17) defining said dragging surface (16).
3. A machine as claimed in claim 2, wherein said driving means (8) comprises opposite crawler tracks (17).
4. A machine as claimed in one or more of the preceding claims, wherein said forming device (4) comprises a forming tube (13) and is adapted to wrap said packing ribbon (51) around said forming tube (13), and wherein said dragging surfaces (16) are provided at said forming tube (13).
5. A machine as claimed in one or more of the preceding claims, wherein said dragging surface (16) is made of elastomer.
6. A machine as claimed in one or more of the preceding claims, wherein said conveying means (2) comprises a deviation unit (10) adapted to deviate said packing ribbons (51) through a right angle.
7. A machine as claimed in one or more of the preceding claims, wherein said conveying means (2) comprises pulling rollers (9e) upstream of said sacking stations (3), in timed relationship with said driving means (8) and adapted to drag said packing ribbons (51) along.
8. A machine as claimed in one or more of the preceding claims, comprising tensioning rollers (11) placed in the vicinity of said stations (3) and provided with an outer surface of high friction.

Patentansprüche

1. Mehrspurige Füllvorrichtung (1), die geeignet ist, geschlossene Beutel (50) aus einer Vielzahl von Verpackungsbändern (51) herzustellen, wobei jedes der genannten Verpackungsbänder (51) eine Längsrichtung (52) und eine Querrichtung (53) senkrecht zur genannten Längsrichtung (52) definiert und die genannte Füllvorrichtung (1) eine Vielzahl von Füllstationen (3) umfasst, von denen jede Folgendes einschließt: Vorrichtungen zum Formen (4) des genannten Verpackungsbands (51), die geeignet sind, einen querliegenden Abschnitt eines der genannten Verpackungsbänder (51) entlang der genannten Längsrichtung (52) so zu falten, dass zwei Längstreifen (54) des genannten querliegenden Abschnitts des genannten Verpackungsbands (51) übereinandergelegt werden, Schweißvorrichtungen

- (5), die geeignet sind, die beiden übereinanderliegenden Längsstreifen (54) zu verschweißen und in bestimmten räumlichen Abständen das genannte Verpackungsband (51) in Querrichtung (53) zu verschweißen, Vorrichtungen zum Füllen (6) eines aus diesem Verpackungsband (51) geformten, in Längs- und Querrichtung verschweißten offenen Beutels, so dass die genannte Querschweißung den Boden des genannten offenen Beutels bildet, Vorrichtungen zum Trennen (7) des genannten Verpackungsbandes (51) auf der genannten Schweißung in Querrichtung, so dass die genannte Schweißung in Querrichtung den Boden des genannten offenen Beutels bildet sowie den Verschluss am Kopfende eines genannten geschlossenen Beutels (50), der im räumlichen Abstand des vorangegangenen Verpackungsbandes (51) realisiert wird, Vorrichtungen zum Mitnehmen (8) des genannten Verpackungsbandes (51), die von den genannten Schweißvorrichtungen (5) getrennt werden, wobei diese Füllvorrichtung (1) außerdem Fördervorrichtungen (2) der genannten Vielzahl von Verpackungsbändern (51) umfasst, die geeignet sind, die genannten Verpackungsbänder (51) entlang einer Abwickelbahn und einer Vorschubrichtung zu befördern, die geeignet ist, jede der genannten Füllstationen (3) mit einem der genannten Verpackungsbänder (51) zu versorgen, **dadurch gekennzeichnet, dass** die genannten Mitnahmeverrichtungen (8) eine Mitnahmefläche (16) mit hoher Reibung umfassen, die geeignet ist, im Kontakt mit dem genannten Band (51) zu interagieren und dieses in Vorschubrichtung mitzunehmen, dadurch, dass die genannten Mitnahmeverrichtungen (8) der genannten verschiedenen Füllstationen (3) unabhängig je nach Spannung der genannten einzelnen Bänder (51) eingestellt werden können und dadurch, dass sie Spannungssensoren (19) der genannten einzelnen Bänder (51) umfasst, die geeignet sind, die Spannung der genannten einzelnen Bänder zu messen.
2. Vorrichtung nach Anspruch 1, bei der die genannten Mitnahmeverrichtungen (8) Laufbänder (17) umfassen, die die genannte Mitnahmefläche (16) definieren.
 3. Vorrichtung nach Anspruch 2, bei der die genannten Mitnahmeverrichtungen (8) gegenüberliegende Laufbänder (17) umfassen.
 4. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche, bei der die genannte Vorrichtung zum Formen (4) ein Formrohr (13) umfasst und geeignet ist, das Verpackungsband (51) um das genannte Formrohr (13) zu wickeln und bei der die genannten Mitnahmeflächen (16) auf dem genannten Formrohr (13) angeordnet sind.
 5. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche, bei der die genannte Mitnahmefläche (16) aus Elastomerwerkstoff besteht.
 6. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche, bei der die genannten Fördervorrichtungen (2) eine Abzweigungsgruppe (10) umfassen, die geeignet ist, die genannten Verpackungsbänder (51) in einem rechten Winkel abzuzweigen.
 7. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche, bei der die genannten Fördervorrichtungen (2) Zugrollen (9e) vor den genannten Füllstationen (3) umfasst, die mit den genannten Mitnahmeverrichtungen (8) synchronisiert und geeignet sind, die genannten Verpackungsbänder (51) mitzunehmen.
 8. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche, die Spannungsrollen (11) umfasst, die in der Nähe der genannten Stationen (3) angeordnet sind und eine Außenfläche mit hoher Reibung aufweisen.

Revendications

1. Machine de remplissage multipistes (1) apte à obtenir des sachets fermés (50) depuis une pluralité de bandes d'emballage (51) chacune desdites bandes d'emballage (51) définissant une direction longitudinale (52) et une direction transversale (53), perpendiculaire à ladite direction longitudinale (52), ladite machine de remplissage (1) comprenant une pluralité de stations de remplissage (3) chacune comprenant : des moyens de formage (4) de ladite bande d'emballage (51) aptes à plier une partie transversale d'une desdites bandes d'emballage (51) le long de ladite direction longitudinale (52), de façon apte à superposer deux bords longitudinaux (54) de ladite partie transversale de ladite bande d'emballage (51), moyens de scellement (5), aptes à sceller lesdits deux bords longitudinaux (54) superposés et à souder, à des intervalles d'espace déterminés, ladite bande d'emballage (51) en direction transversale (53), moyens de remplissage (6) d'un sachet ouvert formé de ladite bande d'emballage (51) scellée longitudinalement et transversalement, de sorte que ledit scellement transversal constitue le fond dudit sachet ouvert, moyens de découpage (7) de ladite bande d'emballage (51) au niveau dudit scellement en direction transversale, de sorte que ledit scellement en direction transversale constitue le fond dudit sachet ouvert et la fermeture de tête dudit sachet fermé (50) réalisée dans l'intervalle d'espace de bande d'emballage (51) précédent, moyens d'entraînement (8) de ladite bande d'emballage (51).

lage (51) séparés desdits moyens de scellement (5), ladite machine de remplissage (1) comprenant en outre des moyens d'acheminement (2) de ladite pluralité de bandes d'emballage (51) aptes à acheminer lesdites bandes d'emballage (51) le long d'une trajectoire de déroulement et un sens d'avance de façon apte à ravitailler chacune desdites stations de remplissage (3) en une desdites bandes d'emballage (51) **caractérisé en ce que** lesdits moyens d'entraînement (8) comprennent une surface d'entraînement (16) à haut frottement apte à interagir en contact avec ladite bande (51) et à entraîner cette dernière dans le sens d'avance, **en ce que** lesdits moyen d'entraînement (8) desdites stations de remplissage (3) différentes, sont réglables indépendamment en fonction de la tension desdites bandes individuelles (51) et **en ce qu'**ils comprennent des capteurs de tension (19) desdites bandes (51), aptes à mesurer la tension desdites bandes individuelles (51).

(11), situés à proximité desdites stations (3) et ayant une surface extérieure à frottement élevé.

2. Machine selon la revendication 1, dans laquelle lesdits moyens d'entraînement (8) comprennent des chenilles (17) définissant ladite surface d'entraînement (16). 5 10 15 20 25
3. Machine selon la revendication 2, dans laquelle lesdits moyens d'entraînement (8) comprennent des chenilles (7) opposées. 30
4. Machine selon une ou plusieurs des revendications précédentes, dans laquelle ledit dispositif de formage (4) comprend un tube de formage (13) et est apte à enrouler ladite bande d'emballage (51) autour dudit tube de formage (13) et dans laquelle lesdites surfaces d'entraînement (16) sont prédisposées au niveau dudit tube de formage (13). 35
5. Machine selon une ou plusieurs des revendications précédentes, dans laquelle la surface d'entraînement (16) est en élastomère. 40
6. Machine selon une ou plusieurs des revendications précédentes, dans laquelle lesdits moyen d'acheminement (2) comprennent un groupe de déviation (10) apte à dévier d'un angle droit lesdites bandes d'emballage (51). 45
7. Machine selon une ou plusieurs des revendications précédentes, dans laquelle, lesdits moyens d'acheminement (2) comprennent des rouleaux de traction (9e), en amont desdites stations de remplissage (3) synchronisés avec lesdits moyens d'entraînement (8) et aptes à entraîner lesdites bandes d'emballage (51). 50 55
8. Machine selon une ou plusieurs des revendications précédentes, comprenant des rouleaux tendeurs

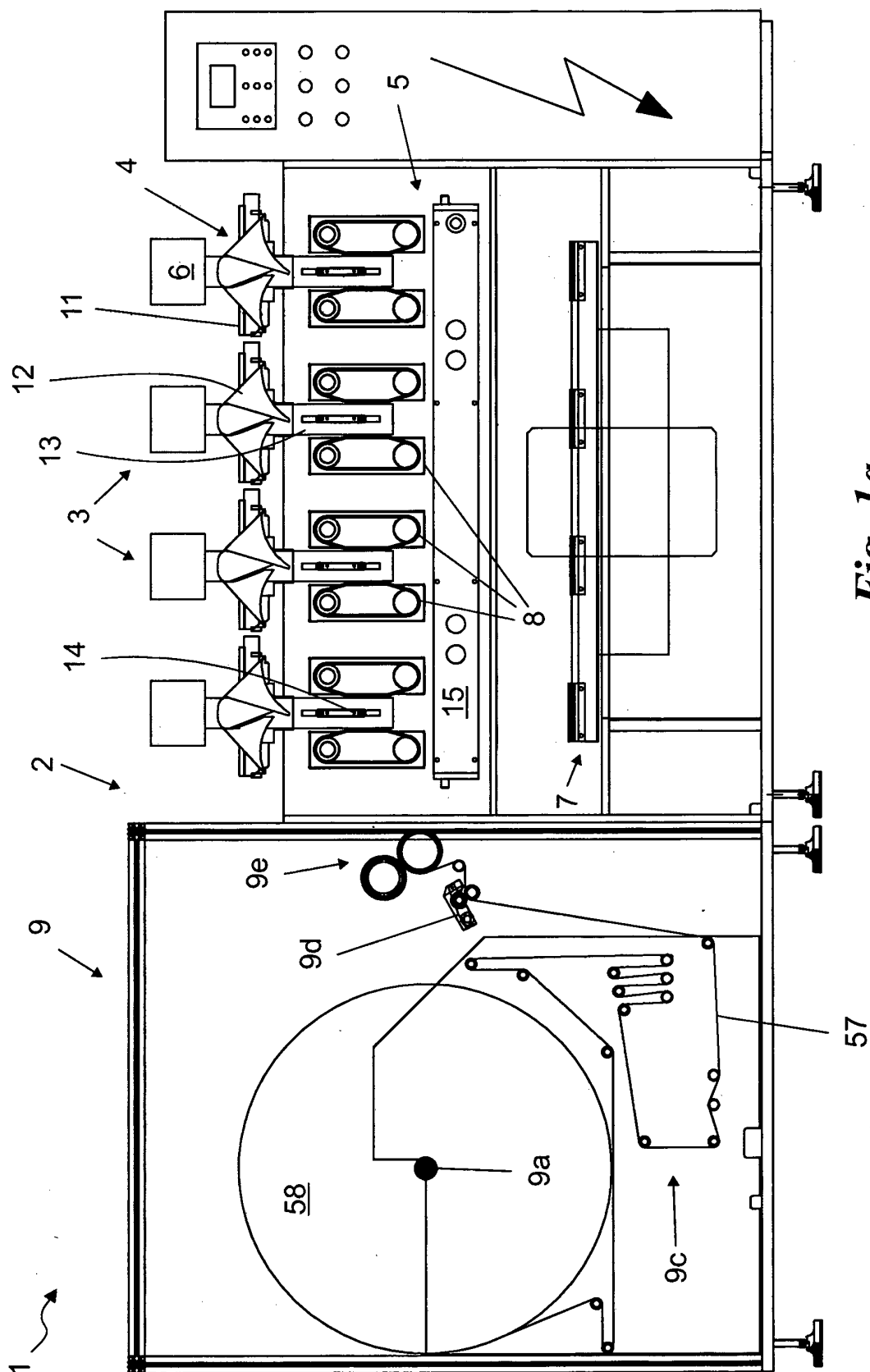


Fig. 1a

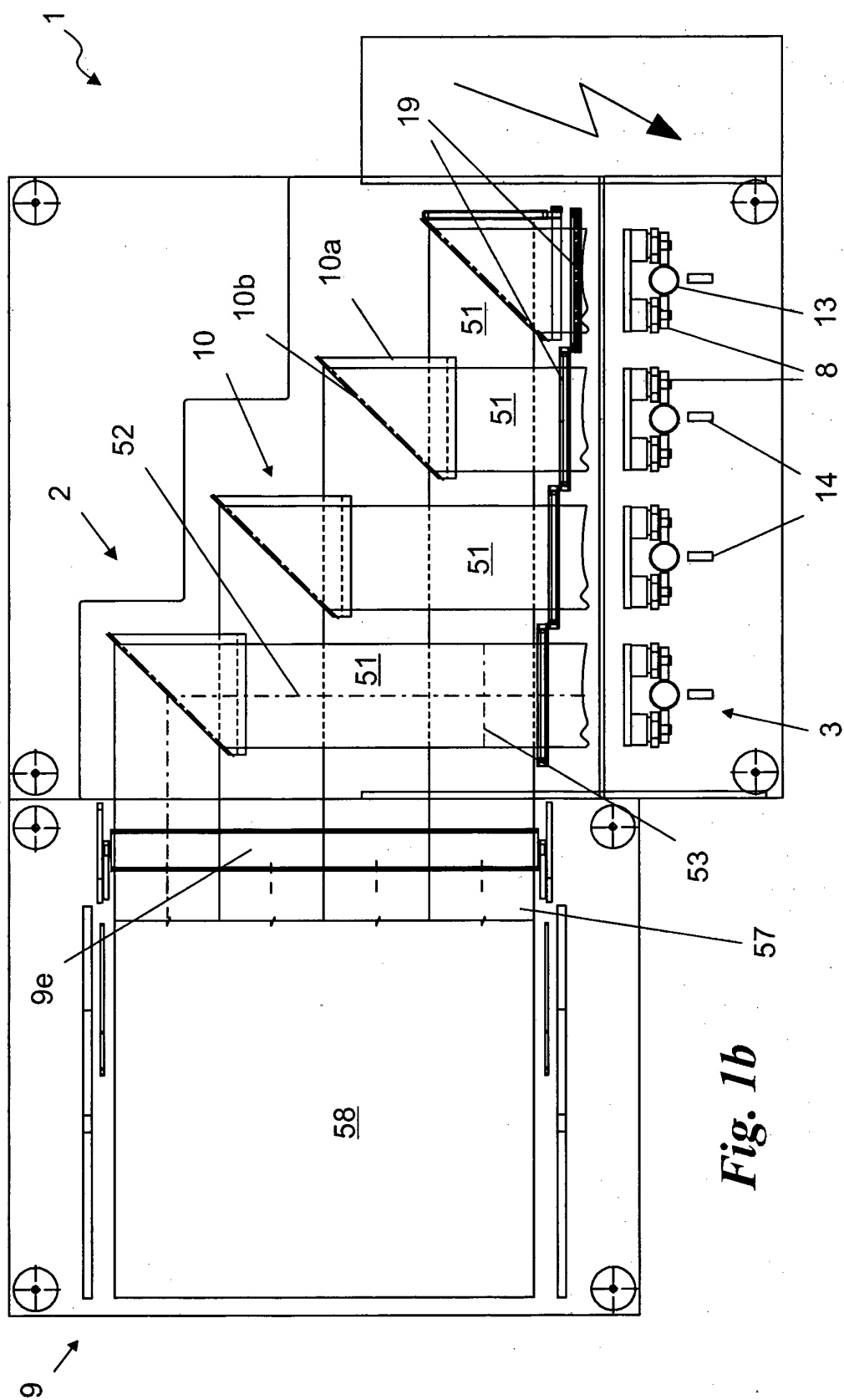


Fig. 2a

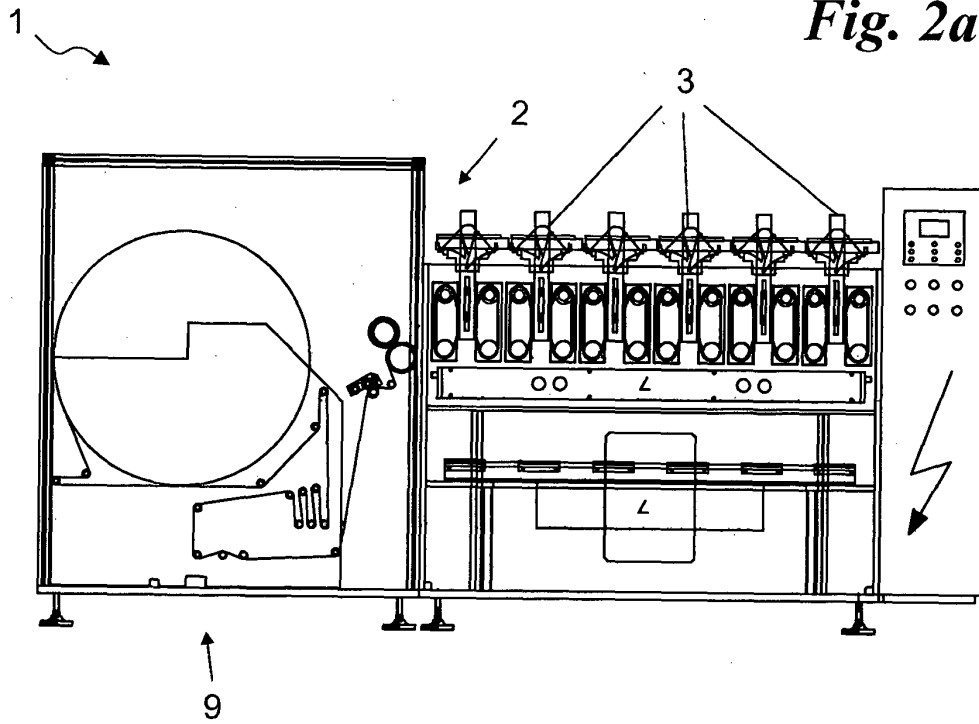
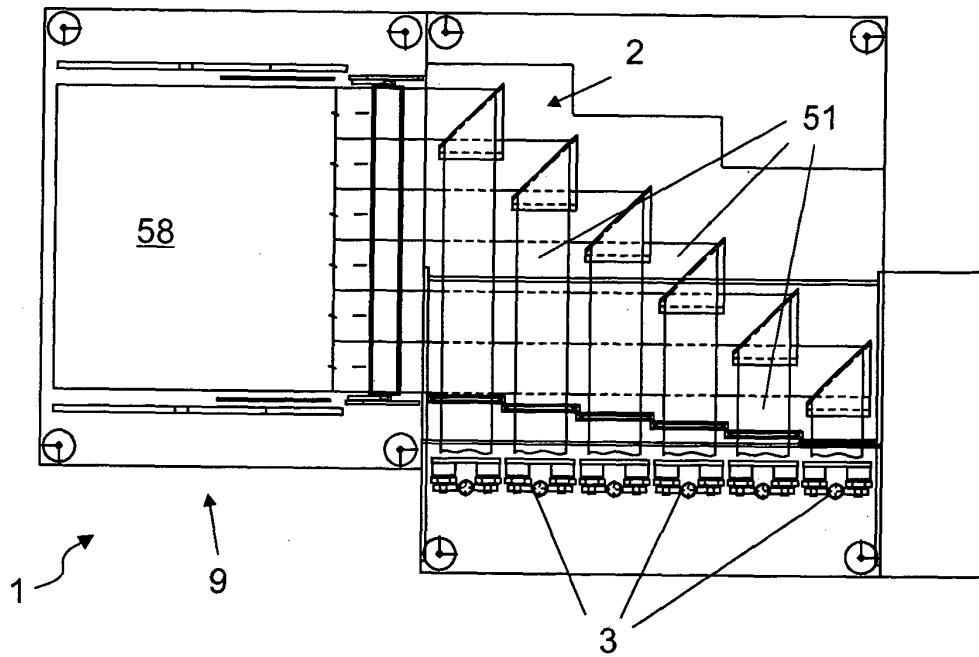
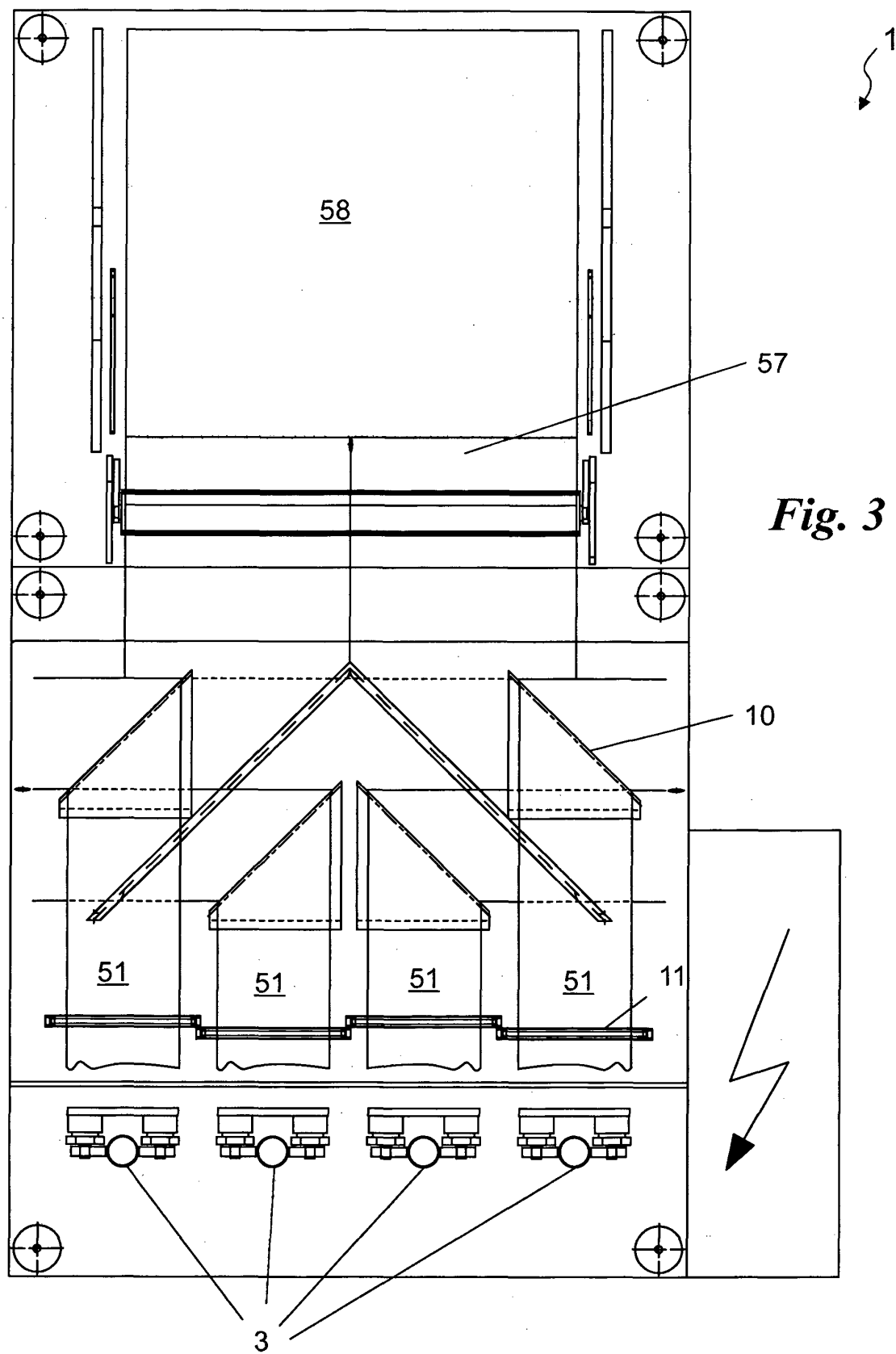
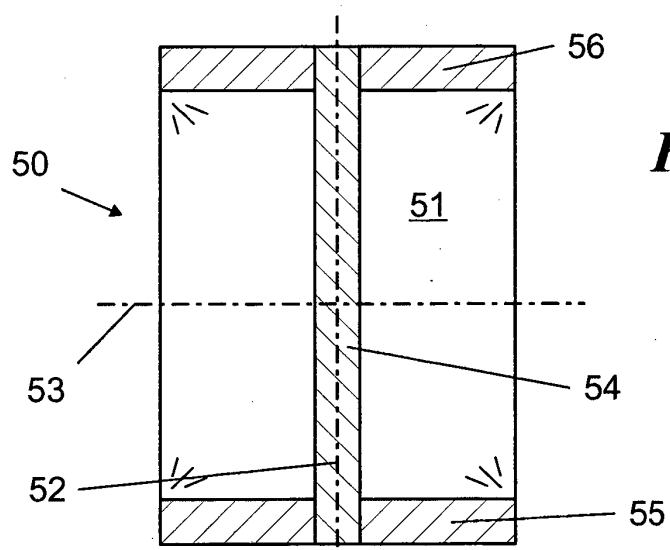
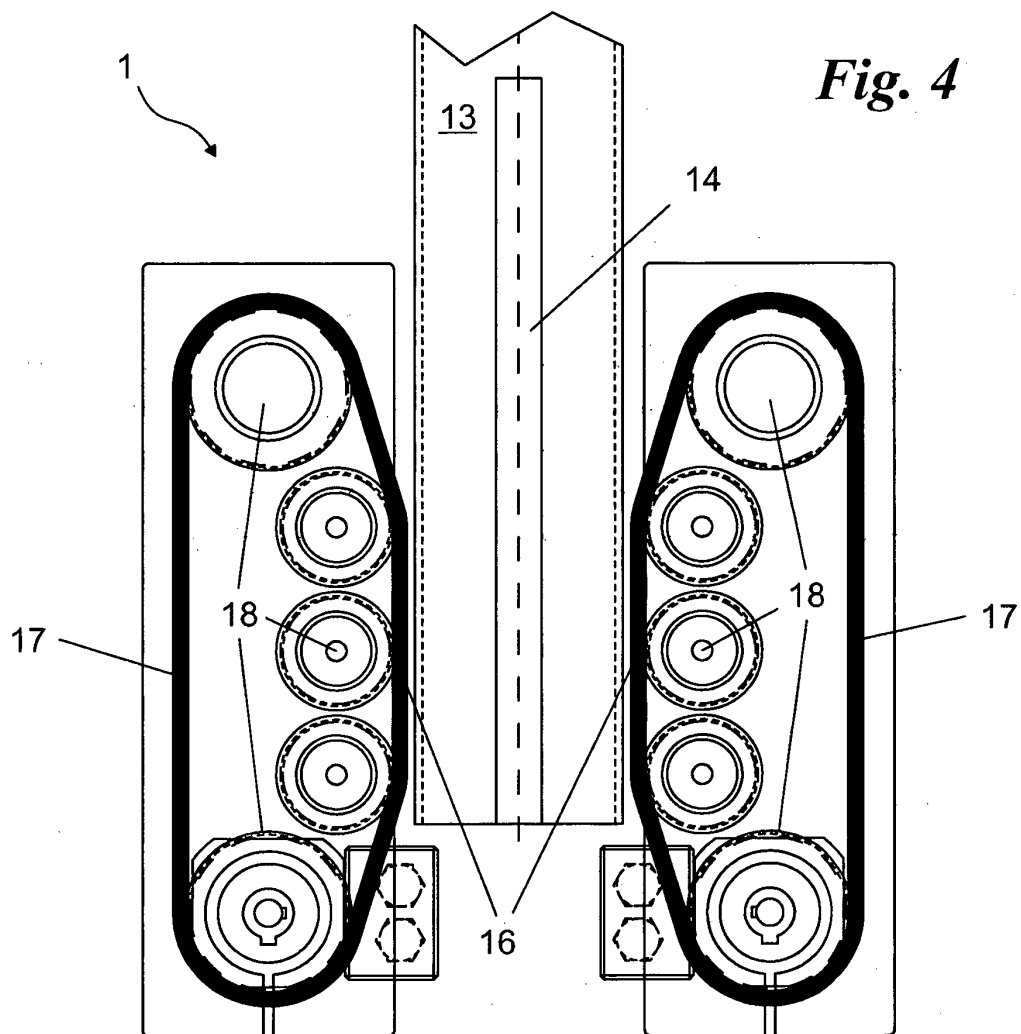


Fig. 2b







REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 6006501 A [0003]