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(54) **Device and method for manufacturing reclosable packagings**

(57) Form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame (2) having a stock of web of foil material (3) and a supply of the web of foil material in flat condition, and a form-fill unit positioned at a front side of the machine, wherein the form-fill unit comprises a form shoulder (13) for transforming the flat web of foil material into a foil tube, as well as a form-fill tube connecting to the form shoulder, having a vertical main plane of section, in which the machine furthermore comprises transverse sealing jaws (71) that are positioned below the lower end of the fill tube (14) for forming transverse seals in the foil tube and which are reciprocally

moveable in a vertical plane perpendicular to the front side of the machine and the said vertical plane of section, the form shoulder being asymmetrically shaped for forming an overlap in the foil tube which extends to at least a short distance from or near the said vertical plane of section, wherein the machine is furthermore provided with first longitudinal sealing means (19) that are positioned at a first side, at one lateral side of the form tube, as considered from the front side of the machine, preferably at a short distance from or near the said vertical plane of section, for forming a first, severable longitudinal seal at the location of the overlap.

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Description

[0001] The invention relates to a device for making bag-shaped packagings from a web of sheet material, such as synthetic foil, for loose products that may or may not be packaged in groups, such as sweets, powdered or granular products, such as ground cheese or flour or viscous products, such as salads. Below products are referred to in general, which therefore may have any given shape or consistency. The invention furthermore relates to such a method. The invention further relates to a reclosable, bag-shaped packaging for said products.

[0002] It is known to package sweets and such loose mass of goods in reclosable bags of foil material. The bag is formed from a sheet of foil material and has a front side and a rear side which at the side edges are sealed together. The material of the rear side continues over the upper side and forms an overlap at the front side. The foil material has an outer layer which is of a different synthetic material than the inner layer. At the location of the overlap (that can be engaged by the hand) its inner layer is attached on the outer layer of the front side by means of a severable seal. On the outer layer of the front side a strip of double-sided adhesive tape may be attached, which at the outer side has been provided with a removable protective strip. By removing the protective strip after opening the bag, during which the severable seal is severed, the strip of adhesive tape forms a sealing that can be opened and closed several times.

[0003] At the lower side the bag may be provided with an inwardly folded bottom area, in order to offer an increase of filling volume of the bag by unfolding.

[0004] The filled bag can be put straight up, but then lacks sufficient stability to remain positively standing up, and may topple over. A shopkeeper will therefore be inclined to put the bag down flat on its rear side, and stack the bags, which harms the presentation of the product.

[0005] Therefore there is a need for such a bag-shaped packaging that is able to stand straight up in a stable manner.

[0006] There furthermore is a need for a form-fill-seal machine by which means such bag-shaped packagings can reliably and easily be made.

[0007] There is furthermore a need for a form-fill-seal machine that is easy to adapt to the wanted packaging with an overlap that can be opened, and which machine can be substantially standard, particularly having transverse sealing jaws that are reciprocally moveable in a vertical plane perpendicular to the front side, as is usual in form-fill-seal machines -that may or may not be so-called continuously operative- (in continuously operative machines the transverse sealing jaws do not only move towards each other and away from each other again, but also up and down, in non-continuously operative machines the motion in the said vertical plane is merely direct according to a straight line towards each other and away from each other).

[0008] There is furthermore a need for a method by which such a bag-shaped packaging can reliably and easily be made.

[0009] From one aspect the invention provides a form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and a form-fill unit positioned at the front side of the machine, wherein the form-fill unit comprises a form shoulder for transforming the flat web of foil material into a foil tube, as well as a form-fill tube connecting to the form shoulder, having a vertical main plane of section, in which the machine furthermore comprises transverse sealing jaws that are positioned below the lower end of the fill tube for forming transverse seals in the foil tube and which are reciprocally moveable in a vertical plane perpendicular to the front side of the machine and the said vertical plane of section, the form shoulder being asymmetrically shaped for forming an overlap in the foil tube which extends to at least a short distance from or near the said vertical plane of section, wherein the machine is furthermore provided with first longitudinal sealing means that are positioned at a first side, at one lateral side of the form tube, as considered from the front side of the machine, preferably at a short distance from or near the said vertical plane of section, for forming a first, severable longitudinal seal at the location of the overlap.

[0010] The asymmetrical position of the overlap realised with this machine makes it possible to place the longitudinal sealing means for the severable seal seam at one lateral side of the fill tube (as considered from the front side), as a result of which a condition has been met for (easily) changing the form-fill unit: after all no longitudinal sealing jaws need to be removed for taking out the form-fill unit from the front. Furthermore a standard machine, in which the transverse sealing jaws reciprocally move in a vertical plane perpendicular to the front side of the machine, can be used here, with only minor adjustments. The owner of such a standard machine it is thus enabled earlier to switch over to making packagings having an overlap that can be opened.

[0011] Preferably the machine is furthermore provided with second longitudinal sealing means positioned at a second side, at one lateral side of the form tube, as considered from the front side of the machine, opposite the first side, for forming at least one longitudinal seal in the foil tube. Preferably two second longitudinal sealing means are provided that are positioned at either side of, preferably equidistant from, the vertical plane of section. Also the longitudinal sealing means for the other side then allow an easy change of the form-fill unit.

[0012] Preferably the form-fill unit at the second side is provided with two protruding form strips for forming longitudinal folds in the foil tube, wherein the second longitudinal sealing means are positioned for sealing the longitudinal folds.

[0013] In that way a stable, reclosable packaging can easily be obtained, which is able to remain standing straight up, both if filled with smaller grains and if filled with larger articles, such as for instance salad, also if only filled to a limited extent, in which the bottom longitudinal seams, just like the severable closing seal and the closing means are arranged running along with the process direction of the foil tube and in the ready packaging form a bottom stabilisation. Arranging the said seals may suffice here. The width of the manufactured bags can simply be changed by changing the frequency in arranging transverse seals. No or hardly any parts that depend on the bag shape or size need to be changed.

[0014] The second longitudinal sealing means may comprise an anvil/form member, that extends between both longitudinal folds for positioning them for sealing.

[0015] Preferably the position of the first and/or second longitudinal sealing means is adjustable in a direction towards/away from the fill tube, so that the cross-section of the fill tube used at a certain moment can be adjusted to. The anvil/form member as well preferably forms an interchangeable part then.

[0016] Preferably the form-fill unit is removably or detachably placed in the machine.

[0017] In a further development which is also applicable per se in other form-fill tubes, the form/fill tube at the first side at the lower end is provided with a first protrusion, situated in or near the vertical plane of section and extending downwards, and which in horizontal direction is free from the remainder of the lower end of the fill tube. The protrusion forms a guide for the tube area at the first side, so that it is narrowed in order to end up crease-free between the transverse sealing jaws. Because the fill tube wall is already interrupted there the foil tube is able to be smoothly subjected to the cross-section transformation. Preferably the first protrusion is pen- or lip-shaped and narrow as a result.

[0018] Preferably the first protrusion with its end smoothly extends beyond the profile of the fill tube, so that the narrowing of the tube is enhanced at that location.

[0019] It is furthermore preferred that the form/fill tube at its lower end is furthermore provided with at least one second protrusion, which is at least situated at the second side and defines a recess with the first protrusion. The recess offers a certain room for the shape transformation, whereas the foil tube is guided and held there where such is necessary.

[0020] In a simple embodiment thereof, the second protrusion forms a sharp guiding edge, as a result of which a self-orienting influence can be exerted on the bottom seal, particularly when the guiding edge is substantially oriented towards the bottom. The sharp edge only takes little space in transverse direction, as a result of which the area within the bottom seal is able to be tightened.

[0021] Preferably two second protrusions are

present, which extend on either side of the vertical plane of section and preferably keep an area free between them in which area a fold-maker is allowed to extend. In this way it is achieved that the said bottom area defined by the two bottom seals can be folded in smoothly, prior to the transverse sealing jaws being active on it. The two second protrusions may advantageously be connected to each other by a plate, for instance a V-shaped plate, which is forming a cavity for the inwardly folded bottom area to be made.

[0022] Thus, after sealing, when leaving in a direction parallel to the main sides, the foil tube is pulled taut and slightly tapering in that direction, in order to ensure that the foil tube at said short side is not folded double when closing the transverse sealing jaws, but at the other short side a sufficient fill opening will each time remain present.

[0023] The form-fill tube may have different cross-sectional shapes, for instance circular. In one embodiment the fill tube has a substantially rectangular cross-section, having the main sides substantially parallel to said vertical plane of section. It is noted that a rectangle also includes a flat cross-section, in which the long sides are buckled or flat bent.

[0024] It is preferred here that the first side of the form-fill tube is bent having a flat surface between bent transitions to the main sides.

[0025] For forming a type of packaging, as discussed in the preamble, which is also reclosable, it is preferred that the machine is furthermore provided with means for applying a strip of doublesided adhesive tape on the web of foil material in the area of the intended overlap.

[0026] Then, the first longitudinal sealing means are preferably positioned for arranging the severable longitudinal seal at the side of the strip of doublesided adhesive that faces away from the outer longitudinal edge of the overlap.

[0027] From a further aspect the invention provides a form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and a form-fill unit positioned at the front side of the machine, wherein the form-fill unit comprises a form shoulder for transforming the flat web of foil material into a foil tube, as well as a form-fill tube connecting to the form shoulder, having a vertical main plane of section, in which the machine furthermore comprises transverse sealing jaws that are positioned below the lower end of the fill tube for forming transverse seals in the foil tube and which are reciprocally moveable in a vertical plane perpendicular to the front side of the machine and said vertical plane of section, the form shoulder being asymmetrically shaped for forming an overlap in the foil tube which extends from a front side of the form tube in a first lateral side, wherein the machine is furthermore provided with first longitudinal sealing means positioned near

said first side, at one lateral side of the form tube, as considered from the front side of the machine, for forming a first, severable longitudinal seal at the location of the overlap.

[0028] Preferably the overlap ends at the first side at at least a short distance from or near the said vertical plane of section.

[0029] Preferably the first longitudinal sealing means are positioned at a short distance from or near the said vertical plane of section.

[0030] In case the form-fill unit is detachably arranged on the frame it can easily be replaced by another unit (possibly the original one of the machine), for instance a unit for forming regular, non-reclosable, cushion-shaped bag-shaped packagings only having one longitudinal seal for permanent sealing of the (in that case very short) overlap. The machine may be a standard machine adapted for the latter packagings, in which the transverse sealing jaws are moveable in a vertical plane perpendicular to the front side of the machine. Said standard machine can then simply be temporarily equipped for making the reclosable packagings, without parts, particularly the transverse sealing jaws, having to be rotated. The unit can also be replaced by a unit for comparable reclosable packagings of a larger cross-section.

[0031] From a further aspect the invention provides a form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and having a form-fill unit, the form-fill unit comprising an asymmetrical form shoulder for transforming the flat web of foil material into a foil tube, while forming an overlap, as well as a form-fill tube connecting to the form shoulder, which tube has a substantially rectangular cross-section and which is positioned in the machine having a first main side facing away from the machine and a second main side facing the machine, wherein the form shoulder is designed for forming the overlap at at least the first or second main side, wherein the form-fill unit at a first short side of the form-fill tube is provided with two protruding form strips for forming longitudinal folds in the foil tube, wherein the form-fill unit is furthermore provided with first longitudinal sealing means for forming a first, severable longitudinal seal in the area of the overlap and with second longitudinal sealing means for forming second longitudinal seals at the location of the longitudinal folds, wherein the form-fill-seal machine is furthermore provided with means for applying a strip of doublesided adhesive tape on the web of foil material in the area of the intended overlap, wherein the form-fill-seal machine is furthermore provided with transverse sealing means positioned below the fill-form unit for forming transverse seals in the foil tube and with means for severing them at the location of the transverse seals.

[0032] With such a machine the aforementioned

packagings can easily be made, whereas a condition is provided for being able to choose the wanted location of overlap, seals and (re)closing means, depending on the type of bag to be made.

[0033] For instance the means for arranging the severable seal may be positioned for arranging the severable seal at the side of the strip of doublesided adhesive facing away from the outer longitudinal edge of the overlap.

[0034] Preferably the second longitudinal sealing means are positioned at the second short side of the form-fill tube.

[0035] Preferably the first short side of the form-fill tube is bent having a flat surface between bent transitions to the main sides.

[0036] Preferably the form-fill unit is detachably arranged on the frame, and/or the first longitudinal sealing means and/or the second longitudinal sealing means are detachably arranged on the frame, for easy adjustment to the desires regarding the shape of the packaging.

[0037] From a further aspect the invention provides a method for making bag-shaped packagings for products, such as edible products, in a form-fill-seal machine from a web of sheet material, such as synthetic foil, wherein the web of material is supplied in a flat condition to an asymmetrical form shoulder positioned at a front side of the machine and a connecting form/fill tube in order to be transformed there into a tube in which the longitudinal edges form an overlap, wherein the overlap is formed eccentrically with respect to a centre plane of the fill tube, which is perpendicular to the front side, and extends up to a lateral side of the fill tube, wherein the overlap, at a distance from the outer longitudinal edge of the overlap, at said lateral side, is secured onto the tube by arranging a severable, closing seal in longitudinal direction of the tube, after which the tube is filled, sealed closed by means of transverse seals extending perpendicularly to the tube and the centre plane.

[0038] Preferably the foil web is supplied to the form shoulder eccentrically with respect to the centre plane of the fill tube, which is perpendicular to the front side, as a result of which the realisation of the overlap shifted to the lateral side of the fill tube is facilitated.

[0039] Preferably at the location of the overlap, in longitudinal direction of the tube an adhesive strip is applied for forming a closing means for the overlap on the packaging, which closing means can be used several times, preferably on the lower side of the foil web, in an edge area thereof.

[0040] Preferably the adhesive strip is adhered in the overlap at the foil area of the overlap that is situated on the inner side.

[0041] Preferably the tube is furthermore folded in an area at a distance from the overlap, preferably at a second side of the fill tube situated opposite the first side, for forming two fold areas extending in longitudinal direction which between them define a bottom area,

wherein the web material at the location of the fold areas is sealed together for forming two bottom longitudinal seals.

[0042] If the bottom area is also folded inwards by means of fold makers that are positioned immediately above and immediately below transverse sealing jaws, an inwardly folded bottom can be obtained without the transverse sealing creating creases there.

[0043] Preferably exclusively said seals are arranged.

[0044] From a further aspect the invention provides a method for making bag-shaped packagings for products, such as edible products, from a web of sheet material, such as synthetic foil, wherein the web of material is transformed from a flat condition into a tube wherein the longitudinal edges form an overlap, wherein the tube at the location of the overlap, at a distance from the outer longitudinal edge of the overlap, is secured onto the tube by arranging a severable closing seal in longitudinal direction of the tube, wherein furthermore at the location of the overlap, in longitudinal direction of the tube, a strip is arranged for forming a closing means for the overlap on the packaging, which closing means can be used several times, wherein the tube furthermore in an area at a distance from the overlap is folded inwards for forming two fold areas extending in longitudinal direction which in between them define a bottom area, wherein the web material at the location of the fold areas is sealed together for forming two bottom longitudinal seals, after which the tube is filled, sealed closed by means of transverse seals extending perpendicularly to the tube and subsequently is separated into bags.

[0045] Further advantageous embodiments of the method according to the invention are the subject of subclaims as attached.

[0046] From a further aspect the invention provides a packaging for a mass of articles, such as sweets, viscous material, such as salad, wherein the packaging is bag-shaped and manufactured from a web of foil material which from a flat condition has been bent into a tube shape having an overlap and after that in filled condition is cut into (tube) sections for separating the manufactured packaging, wherein the packaging at the cutting edges of the section in question is sealed closed for forming side edges, wherein the packaging has two main sides and a bottom area, which extends perpendicular to the side edges and forms two bottom edges which between them define an inwardly folded bottom strip and each with a connecting main side of the packaging form a sealed bottom seam, wherein the overlap extends over a first main side and at a distance from its end edge is sealed to said main side by means of a closed but severable seal, and wherein the packaging at the location of the overlap is provided with means that enable repeated opening and closing of the packaging. Preferably the bottom longitudinal seals and the transverse seals overlap each other in the corner areas that form the boundary of the inside of the packaging.

[0047] Such a reclosable packaging is easy in use

and prior to and after use can be placed straight up in a stable manner, particularly when presented for sale in a shop. The use of space thus remains limited to the bottom profile.

[0048] Preferably the means that enable repeated opening and closing of the packaging are formed by a strip of doublesided adhesive, preferably provided with a detachable protective strip, in which the strip of adhesive preferably is permanently adhered to the first main side.

[0049] The invention will be elucidated on the basis of an exemplary embodiment shown in the attached drawings, in which:

Figure 1 shows a schematic front view of a form-fill-seal machine according to the invention;

Figure 1 A-E show respective perspective views of various sides of a form-fill unit for the machine of figure 1 and a schematic radial view on it, respectively;

Figures 2A-E show some schematic cross-sections at the location of the planes of section IIA-D in figure 1 E and IIE in figure 1 D;

Figure 2F shows a schematic horizontal cross-section of an embodiment of the machine according to the invention having a circular fill tube; and

Figures 3A-C show a front view, a cross-section of a packaging according to the invention, however without filling, and a view of a filled packaging according to the invention.

[0050] The form-fill-seal machine 1 in figure 1 comprises a frame 2, on which the various parts of the machine have been arranged and on which operation and control means that are not further shown are also included.

[0051] At the right-hand side the frame 2 is provided with a stock roll 3 of a web F of foil material, which via a number of free-running circulating rollers 7 is passed upwards to a horizontal track. The foil may for instance be a known multi-layered foil having specifications OPP/OPA/PFP having respective thicknesses of 20/15/50 µm, available from Amcor, in Gent, Belgium. In the machine a stock roll 4 of doublesided adhesive tape 57 has been arranged. The doublesided adhesive tape 57 is provided with a protective sheet 57c, at the radial inside as considered on the roll. The adhesive tape 57 is passed upwards to end up against the lower side of the web F at the location of the roller 5. Immediately downstream of the roller 5 two rollers 5a, 5b are arranged, which guide the adhesive strip 57 and the web F, during continuous transport in the direction C.

[0052] At the front side (the left-hand side in the drawing) of the machine 1 a form-fill unit 10 is removably/

replaceably arranged on the frame 2. On either side of the form unit 10, particularly its tube 14, two foil drive units 80 are attached, which each comprise a frame 81 and a vacuum belt 82. The frame 81 forms a unity with a holder 83 which can be attached to two rods 84 attached in the frame 2 (figure 1 A). The distance between the holders 83 is adjustable with means that are not further shown.

[0053] Vertically below from it, there is a sealing station 70, having in absolute sense horizontally, in the direction G, synchronously perpendicular to the front side reciprocally movable transverse sealing jaws 71a, 71b.

[0054] At the front side of the machine 1 doors 8 that can be opened are furthermore provided, in order to get to the form-fill unit. At the indicated side of the machine 1 an operation panel 9 is furthermore shown.

[0055] On top of the form-fill unit 10 a fill chute 6 is also shown, for receiving small articles to be packaged, such as sweets, from the direction F.

[0056] The form-fill unit 10 is further shown in the figures 1 A-E and 2A-D. The form-fill unit 10 has a frame 11, that can be suspended and attached to the frame 2 of the machine 1. The frame 11 comprises a bracket 12 which is formed as one unity with the girders 16, on which a support plate 15 is attached. On the support plate 15 an asymmetrical form shoulder 13 is attached, which will be further discussed. A fill tube 14 extends through the form shoulder 13, which fill tube 14 at the upper end, spaced apart above the form shoulder 13, is attached to the upper end of the bracket 12. Bracket 12, form shoulder 13 and fill tube 14 form one unity, that can be kept in stock in various embodiments and can be placed in the frame 2 when a certain bag shape has to be made. For attachment in the frame 2 the girders 16 have an inverted U-shape, in order to be able to be placed on placement pins 19a, which with ends 19 are permanently attached to the frame 2. The pins 19a have a length that corresponds to the length of the girders 16. The ends 19 form a stop for the girders 16, for correct placement.

[0057] On the plate 12 a form shoulder 13 is attached, which, as can clearly be seen in the figures 1 A-E, is asymmetric.

[0058] As can be seen in figure 2A the tube 14 extends vertically through the body of the form shoulder 13, in a correspondingly shaped vertical passage 93 thereof. The collar surface 90 of the form shoulder 13 on the one hand slopes downwards with an inclined surface 91 into a narrowing lip 92, which runs to the left short side of the passage 93. Around it, on the other hand, extends the (vertical) straight end edge 94 of the form shoulder 13, which edge has an upper surface 90 that is horizontal. Said edge 94 is also turned at the corner, running about the lip 92, and therewith defines a sideward opening 95 through which the edge area of the foil web F, which is to form an overlap, is able to move. The lip 92 extends to near the vertical main plane S.

[0059] The fill tube 14 is accommodated with play in

the passage 93, which is sufficient for movement of the foil web F, which is then transformed into a tube F', over the circumferential surface of the tube 14. At the location of lip 92 the passage 93 is slightly broader, at the opposite short side much broader.

[0060] As can be seen in figure 2C, the cross-section of the tube is flat rectangular, having a vertical main plane or plane of symmetry S. The one short side forms a flat surface at 44, which surface via bent corners 46 changes into flat main sides 41 and 42. The other short side has a flat surface 43, which in the area immediately below the shoulder 13 is provided with protruding longitudinal strips 45 in the extension of the sides 41, 42. Said strips 45 are only short considered in tube direction.

[0061] Immediately below the form shoulder 13 two longitudinal sealing stations 19 and 20 are arranged, which, as can be seen in the figures 1A-E, each comprise a girder 17, by which means they are attached to the holders 83, which, as already mentioned, are adjustably attached to the frame 2. The mutual distance of the longitudinal sealing stations can thus be adjusted with the mutual distance of the belts 82.

[0062] The one longitudinal sealing station 19 comprises an upright 21 mounted on a girder 17, on which girder a holder 22 is attached. In the holder 22 pneumatic means that are not further shown are provided, by means of which the sealing head holder 23 attached thereon can be moved in horizontal direction towards the tube 14 and away from it. The sealing head holder 23 holds a longitudinal sealing head 23a, provided with longitudinal sealing surface 23b (figure 2B). The longitudinal sealing surface 23b is positioned to cooperate with flat surface 44, which then serves as counter surface or anvil, immediately adjacent to the plane S. A vertical plate 24 is attached to the rear side of the holder 22, on which plate a protective cover can be arranged.

[0063] The other longitudinal sealing station 20 is designed double, and is operative in a direction perpendicular to the direction of the first longitudinal sealing station 19. On the cross girder 17 an upright 26 is mounted, on which a horizontal mounting plate 31 is attached. On the other side of the mounting plate 31 a form member 32 is attached, which extends to near the short surface 43 of the tube 14, while leaving play for the web of foil F', and at the corners is provided with seal-rubber seal anvils 34, which are facing sideways, perpendicular to the normal of the flat surface 44 situated on the other short side. The form member 32 is detachable from the plate 31 by means of screw handles 28b, in order to be replaced by a form member having another shape or set-up, to be used with another form tube.

[0064] At the outer side of the strips 30 longitudinal sealing heads 37a are positioned, which are provided with longitudinal sealing surfaces 37 for cooperation with the said seal anvils 34.

[0065] The longitudinal sealing heads 37a are at-

tached on holders 37 which, in a manner comparable to the one of the holders 22, are attached on holders 27, in which pneumatic means that are not shown are included for reciprocally moving the sealing head holders 27, and thus the sealing heads 37. As can be seen in figure 2B the holders 27 are detachably attached on the aforementioned mounting plate 31, by means of screw handles 28a. As can be seen in figure 1 B the screw knobs 28a (twice) and 28b are always provided in pairs. At the rear side of the holder 37 a vertical plate 29 is attached, on which said protective cover can be arranged. The position of the holders 27 in a direction parallel to the plate 31 is adjustable, see arrows.

[0066] A pair of vertical guiding plates 30 is also attached on the holder 32, which are located at the short sides for the sealing heads 37 and are provided with parallel, vertical and flat portions 34 and with run-in strips 33 that converge with respect to each other. The plates 30 are situated at a short distance for the anvils 34 and are provided with a passage (not shown), for the sealing heads 37.

[0067] As can be seen in the figures 1 A-D the lower end of the tube 14 is shaped in a particular way, and namely particularly the lower end of the strip 44, which in the shape of a tapering lip 74 is bent concave and then convex again to the outside, extending beyond the profile of the tube 14 as it is above it. At the opposite short side the tube 14 at its lower end is provided with a V-shaped guide 77 (figure 2E) oriented to the inside with its bottom, which guide has edges 78a,b that are placed slightly within the corners of the tube 14. At the upper side the guide 77 is covered by a plate 79. Between the guide and the lip 74 an open space 76 is realised, which in this example, is upwardly limited by horizontal lower edge 75 of the main sides 41 and 42 of the tube 14.

[0068] Above the lower end of the guide 77 a fold maker 102a is positioned which is provided with an edge 103a, which fold maker 102a is plate-shaped and arranged at the end of a rod 101 a, which is adjustably accommodated in holder 100a which is permanent to the frame 2. Below it a comparable fold maker 102b is positioned, arranged at the end of a pin 101 b, adjustably accommodated in holder 100b, and provided with a nose 103b having a run-out edge. The fold maker 102b is placed at vertical distance X below the fold maker 102a in order to make movement of the transverse sealing jaws 71 a-b in the direction G in between them possible. The holders 100a and 100b are reciprocally movable in a direction parallel to the pins 101 a and 101 b, in register with the motion of the transverse sealing jaws.

[0069] For making the reclosable packagings as shown in figures 3A and 3B use can be made of a foil material in the form of a laminate, having for instance a polythene inner layer that will come to lie at the inner side of the bag and a polypropene outer layer that will come to lie at the outer side of the bag.

[0070] The foil web is unwound from the stock roll 3

in the direction A, and runs upwards (F) via turn rollers 7, and then horizontally (C) over the roller 5 where the doublesided adhesive tape 57 is added, which originates from stock roll 4 rotating in the direction B. With the adhesive strip 57 attached at the lower side, the protective sheet 57c still below, the foil web F runs to form shoulder 13, and at that location is transformed into a tube shape corresponding to tube 14.

[0071] As schematically shown in figure 2A the centre line of the foil web F that is transported in the direction C to the form shoulder 13 here lies staggered over a distance Y with respect to the vertical plane T through the centre of the tube 14 (perpendicular to plane S). As a result when passing over the form shoulder 13 the edge area provided with the adhesive strip 57 is brought a considerable distance, as considered in the drawing at the left-hand side, from the plane T, up to the left-hand side of the tube 14, to near the plane S.

[0072] As indicated in figure 2B, the overlap extends further to the main side 41 of the tube 14, which side faces the front side 8 of the machine 1. At that location at its (at that moment) outer side, on the outer layer of polypropene, of the edge area of the foil web F, the doublesided adhesive strip 57 is present, its protective sheet 57c also situated at the outer side, so that at that location no adhesion to the inner surface of the overlap formed is effected.

[0073] At the other short side the strips 45 ensure two folds in the foil web F', for which the material originates from foil material present in the widened area situated there in the passage 93. Due to the strips 30 and the holder 32 with anvil surfaces 34, the two folds retain their flat shape.

[0074] The tubular shape F' of the foil shown in figure 2B, is secured by operating the longitudinal sealing stations 19 and 20, so that the longitudinal sealing head 23 in cooperation with the flat surface 44, by heat sealing forms a longitudinal seal between the inner surface of the overlap and the outer surface of the foil area situated beneath it, which foil area forms the edge area of the foil web F onto which the adhesive strip 57 has been arranged. Thus the layer of polypropene is sealed to the layer of polythene here, which seal can be severed when opening the packaging to be made. Note that (figure 2B) the location of the seal is now situated adjacent to the plane S.

[0075] At the other short side sealing of the inner layer to the inner layer of foil F takes place, that means of polythene to polythene, by cooperation of the anvil surfaces 34 and the longitudinal sealing heads 37. As a result a permanent, firm longitudinal seam 58a, b (see figures 3A,B) is formed.

[0076] At the lower end of the tube 14 the area near the longitudinal seam formed on the flat surface 44 is smoothly urged to the outside by the lip 74, in which the material of the foil that is necessary to that end is obtained by the recesses 76. The edges 78a,b keep the bottom edges 58a,b in their place and orient them such

that they are parallel to the closing plane of the transverse sealing jaws.

[0077] The fold maker 102a here extends in the V-space within the guide 77, in order to form an inwardly folded bottom area, in the bag yet to be made, without creases arising. The V-space is large enough for forming the inwardly folded bottom area. When the transverse sealing jaws 71 a,b have been opened and the foil tube has been moved downwards by the vacuum belts 82 and after that the transverse sealing jaws have been brought towards each other again, the fold maker 102b prevents that material present in the bag that is below it and has to be sealed and separated now, would urge the inwardly folded bottom area of the next bag to the outside just prior to closing the transverse sealing jaws.

[0078] When leaving the lower end of the tube 14 the foil tube F' is thus pulled slightly flatter in order to thus be engaged without creases by the transverse sealing jaws 71 a, 71 b moved towards each other in the direction G. The transverse sealing jaws 71 a, 71 b, in which a cutting means has also been incorporated, here move between the both fold formers 102a,b and form an upper transverse seal of a previous packaging and a lower transverse seal for the next packaging. During transverse sealing the product is introduced through the fill tube into the bag that lies on top and is still in open connection with the foil tube. After sealing has been completed, the cutting means in the transverse sealing jaws 71 a, 71 b is activated, to separate a packaging. Earlier on, when closing the previous packaging by transverse sealing, this packaging was filled with products that fell downwards in the direction F in the chute 6 and subsequently through the inside of the tube 14. The plate 79 prevents that material ends up in the bottom areas to be made/made, which would otherwise render the sealing difficult.

[0079] Finally a bag according to figures 3A-C has been obtained, in which a bag 50 is shown, having a rear side 52 and a front side 51, in which the front side is attached to the overlap 53 at the upper edge by means of a longitudinal seal 56 in such a manner that it can be manually severed, which overlap is a continuation of the rear side 52, passing over the upper side 54 of the packaging 50. Approximately halfway the overlap 53 the double-sided adhesive strip 57 is positioned, which with the adhesive side 57b is adhered to the outer layer of the front side 51 and with the other adhesive side 57a is still covered by protective strip 57c. Below the adhesive strip 57 hand engagement part 61 is formed, having lower edge 62.

[0080] In the bottom area of the bag 50 the portion indicated by 59, which has abutted the side 43 of the tube 14, is now folded double at the location of folding line 63, in order to form an inwardly turned bottom area. In the lower edge at the location of bottom seams 58a, 58b formed with the longitudinal sealing heads 37 this area changes into sides 51 and 52.

[0081] In figure 3A the transverse seals 64 formed by means of transverse sealing jaws 71 a,b are shown, which transverse seals, at the location of areas 65, 66 and 67, coincide with the seal 56, the adhesive strip 57 and the bottom seams 58a, 58b. At the location of areas 68 the double folded bottom area 59 is sealed at its ends.

[0082] In filled condition the bag 50 can be placed straight up, that means with the lower edges 60a, 60b of the bottom seams 58a, 58b on a surface, wherein the overlap 53 is situated at the top, see figure 3C.

[0083] For use the user takes the edge area 61 of the overlap 53, to pull it upwards and thus sever the seam 56. After taking the product out of the bag 50 the user can remove the protective strip 57c and then adhere the overlap 53 to the adhesive layer 57a on the front side 51 of the bag 50. The adhesive selected for the adhesive strip 57 is suitable to adhere to both the inner layer and the outer layer.

[0084] It is noted that embodiments are also possible in which the front side 51 is folded down, so that the inner side of that material is turned to the outside and then the longitudinal sealing head 23 makes an inside-inside seal, that can also be severable, in case suitable material is selected.

[0085] In figure 2F an alternative fill tube shape 114 is shown, which in this case is circular. Optionally the fill tube 114 at the right-hand side may be provided with protrusions such as the aforementioned short protrusions 45, for preparing the formation of the bottom seal areas. For reasons of clarity this is further left out. Furthermore only the sealing head for forming the severable seal is shown, in a position comparable to those of the previous figures, that means having the sealing surface 23b just adjacent to the plane of symmetry S. Furthermore, the transverse sealing jaws 71 a, b are schematically shown, which in the direction G can be moved towards and away from each other. The transverse sealing jaws 71 a, b are of a standard machine, possibly continuously operative, accommodated therein in a standard manner. They are symmetrical with respect to the plane of symmetry S of the fill tube 114. The attachment of the longitudinal sealing head 23 is, just like in the embodiment of the previous figures, situated at a lateral side thereof.

[0086] As can be seen, the foil web F is again supplied eccentrically, having eccentricity Y between centre line U of the foil web F and the tube plane of symmetry T. The eccentric supply of the foil web is possible on standard machines, because the width of the supply rollers 7 and the like leaves room to that end, or its trestle can be moved in transverse direction.

[0087] As can be seen in figure 2F, in this case the edge area provided with the adhesive strip 57 may extend far to the left about the foil tube 14, approximately 90° past the plane of symmetry T. By means of the sealing head 23 at the location of the start of the overlap a seal can be formed, which is situated just adjacent to

the plane of symmetry S, so that there will be no particular difficulties in opening the packaging later.

[0088] With the asymmetrical form shoulder according to the invention and/or the eccentric supply of the foil web F the severable closing seam can each time be arranged on the left-hand side near the plane of symmetry S, which is also near the closing surface of the transverse sealing jaws 71a, b at the side of the overlap. The possible bottom seals can be made at the opposite side. On a standard machine, the transverse sealing jaws 71a, b can thus be maintained, and one can limit oneself to moving the wanted longitudinal sealing heads and the unit of form shoulder/ fill tube.

Claims

1. Form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and a form-fill unit positioned at a front side of the machine, wherein the form-fill unit comprises a form shoulder for transforming the flat web of foil material into a foil tube, as well as a form-fill tube connecting to the form shoulder, having a vertical main plane of section, in which the machine furthermore comprises transverse sealing jaws that are positioned below the lower end of the fill tube for forming transverse seals in the foil tube and which are reciprocally moveable in a vertical plane perpendicular to the front side of the machine and the said vertical plane of section, the form shoulder being asymmetrically shaped for forming an overlap in the foil tube which extends to at least a short distance from or near the said vertical plane of section, wherein the machine is furthermore provided with first longitudinal sealing means that are positioned at a first side, at one lateral side of the form tube, as considered from the front side of the machine, preferably at a short distance from or near the said vertical plane of section, for forming a first, severable longitudinal seal at the location of the overlap.
2. Form-fill-seal machine according to claim 1, furthermore provided with second longitudinal sealing means positioned at a second side, at one lateral side of the form tube, as considered from the front side of the machine, opposite the first side, for forming at least one longitudinal seal in the foil tube.
3. Form-fill-seal machine according to claim 2, wherein two longitudinal sealing means are provided that are positioned at either side of, preferably equidistant from, the vertical plane of section, wherein preferably the form-fill unit at the second side is pro-

vided with two protruding form strips for forming longitudinal folds in the foil tube, wherein preferably the second longitudinal sealing means are positioned for sealing the longitudinal folds.

4. Form-fill-seal machine according to claim 3, wherein second longitudinal sealing means comprise an anvil/form member, that extends between both longitudinal folds for positioning them for sealing.
5. Form-fill-seal machine according to any one of the claims 1-4, wherein the position of the first and/or second longitudinal sealing means is adjustable in a direction towards/away from the fill tube.
6. Form-fill-seal machine according to claim 4 and 5, wherein the anvil/form member forms an interchangeable part.
7. Form-fill-seal machine according to any one of the preceding claims, wherein the form-fill unit is detachably placed in the machine.
8. Form-fill-seal machine according to any one of the preceding claims, wherein the form/fill tube at the first side at the lower end is provided with a first protrusion, situated in or near the vertical plane of section and extending downwards, and which in horizontal direction is free from the remainder of the lower end of the fill tube, wherein preferably the first protrusion is pen- or lip-shaped.
9. Form-fill-seal machine according to claim 8, wherein the first protrusion with its end extends beyond the profile of the fill tube.
10. Form-fill-seal machine according to claim 8 or 9, wherein the form/fill tube at its lower end is furthermore provided with at least a second protrusion, which is at least situated at the second side and defines a recess with the first protrusion, wherein preferably the second protrusion forms a sharp guiding edge, particularly substantially oriented towards the bottom.
11. Form-fill-seal machine according to claim 10, wherein two second protrusions are present, which extend on either side of the vertical plane of section and preferably keep an area free between them, in which area a fold-maker is able to extend, wherein the two second protrusions preferably are connected to each other by a plate, for instance a V-shaped plate, which is forming a cavity for the inwardly folded bottom area to be made.
12. Form-fill-seal machine according to any one of the preceding claims, wherein the fill tube has a substantially rectangular cross-section, having the

main sides substantially parallel to the vertical plane of section, wherein preferably the first side of the form and fill tube is bent having a flat surface between bent transitions to the main sides.

13. Form-fill-seal machine according to any one of the preceding claims, furthermore provided with means for arranging a strip of doublesided adhesive tape on the web of foil material in the area of the intended overlap, wherein preferably the first longitudinal sealing means are positioned for arranging the severable longitudinal seal at the side of the strip of doublesided adhesive that faces away from the outer longitudinal edge of the overlap.

14. Form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and a form-fill unit positioned at the front side of the machine, wherein the form-fill unit comprises a form shoulder for transforming the flat web of foil material into a foil tube, as well as a form-fill tube connecting to the form shoulder, having a vertical main plane of section, in which the machine furthermore comprises transverse sealing jaws that are positioned below the lower end of the fill tube for forming transverse seals in the foil tube and which are reciprocally moveable in a vertical plane perpendicular to the front side of the machine and said vertical plane of section, the form shoulder being asymmetrically shaped for forming an overlap in the foil tube which extends from a front side of the form tube to in a first lateral side, wherein the machine is furthermore provided with first longitudinal sealing means positioned near said first side, at one lateral side of the form tube, as considered from the front side of the machine, for forming a first, severable longitudinal seal at the location of the overlap.

15. Form-fill-seal machine according to claim 14, wherein the overlap ends at the first side at at least a short distance from or near the said vertical plane of section, wherein preferably the first longitudinal sealing means are positioned at a short distance from or near the said vertical plane of section.

16. Form-fill-seal machine for making bag-shaped packagings for products, such as edible products, from a web of foil material, such as synthetic foil, the machine comprising a frame having a stock of web of foil material and a supply of the web of foil material in flat condition, and having a form-fill unit, the form-fill unit comprising an asymmetrical form shoulder for transforming the flat web of foil material into a foil tube, while forming an overlap, as well as

a form-fill tube connecting to the form shoulder, which tube has a substantially rectangular cross-section and which is positioned in the machine having a first main side facing away from the machine and a second main side facing the machine, wherein the form shoulder is designed for forming the overlap at at least the first or second main side, wherein the form-fill unit at a first short side of the form-fill tube is provided with two protruding form strips for forming longitudinal folds in the foil tube, wherein the form-fill unit is furthermore provided with first longitudinal sealing means for forming a first, severable longitudinal seal in the area of the overlap and with second longitudinal sealing means for forming second longitudinal seals at the location of the longitudinal folds, wherein the form-fill-seal machine is furthermore provided with means for applying a strip of doublesided adhesive tape on the web of foil material in the area of the intended overlap, wherein the form-fill-seal machine is furthermore provided with transverse sealing means positioned below the fill-form unit for forming transverse seals in the foil tube and with means for severing them at the location of the transverse seals.

17. Form-fill-seal machine according to claim 16, wherein the means for arranging the severable seal are positioned for arranging the severable seal at the side of the strip of doublesided adhesive facing away from the outer longitudinal edge of the overlap.

18. Form-fill-seal machine according to claim 16 or 17, wherein the second longitudinal sealing means are positioned at the second short side of the form-fill tube.

19. Form-fill-seal machine according to claim 16, 17 or 18, wherein the first short side of the form-fill tube is bent having a flat surface between bent transitions to the main sides.

20. Form-fill-seal machine according to any one of the claims 16-19, wherein the form-fill unit is detachably arranged on the frame.

21. Form-fill-seal machine according to any one of the claims 16-20, wherein the first longitudinal sealing means and/or the second longitudinal sealing means are detachably arranged on the frame.

22. Method for making bag-shaped packagings for products, such as edible products, in a form-fill-seal machine from a web of sheet material, such as synthetic foil, wherein the web of material is supplied in a flat condition to an asymmetrical form shoulder positioned at a front side of the machine and a connecting form/fill tube in order to be transformed

there into a tube in which the longitudinal edges form an overlap, wherein the overlap is formed eccentrically with respect to a centre plane of the fill tube, which is perpendicular to the front side, and extends up to a lateral side of the fill tube, wherein the overlap, at a distance from the outer longitudinal edge of the overlap, at said lateral side, is secured onto the tube by arranging a severable, closing seal in longitudinal direction of the tube, after which the tube is filled, sealed closed by means of transverse seals extending perpendicularly to the tube and the centre plane.

23. Method according to claim 22, wherein the foil web is supplied to the form shoulder eccentrically with respect to the centre plane of the fill tube, which is perpendicular to the front side.

24. Method according to claim 22 or 23, wherein at the location of the overlap, in longitudinal direction of the tube an adhesive strip is applied for forming a closing means for the overlap on the packaging, which closing means can be used several times, wherein preferably the adhesive strip is applied on the lower side of the foil web, in an edge area thereof, wherein preferably the adhesive strip is adhered in the overlap at the foil area of the overlap that is situated on the inner side.

25. Method according to any one of the claims 22-24, wherein the tube is furthermore folded inwards in an area at a distance from the overlap, preferably at a second side of the fill tube situated opposite the first side, for forming two fold areas extending in longitudinal direction which between them define a bottom area, wherein the web material at the location of the fold areas is sealed together for forming two bottom longitudinal seals, wherein preferably the bottom area is folded inwards by means of fold makers that are positioned immediately above and immediately below transverse sealing jaws, wherein preferably exclusively said seals are arranged.

26. Method for making bag-shaped packagings for products, such as edible products, from a web of sheet material, such as synthetic foil, wherein the web of material is transformed from a flat condition into a tube wherein the longitudinal edges form an overlap, wherein the tube at the location of the overlap, at a distance from the outer longitudinal edge of the overlap, is secured onto the tube by arranging a severable closing seal in longitudinal direction of the tube, wherein furthermore at the location of the overlap, in longitudinal direction of the tube, a strip is arranged for forming a closing means for the overlap on the packaging, which closing means can be used several times, wherein the tube furthermore in an area at a distance from the overlap is folded in-

wards for forming two fold areas extending in longitudinal direction which in between them define a bottom area, wherein the web material at the location of the fold areas is sealed together for forming two bottom longitudinal seals, after which the tube is filled, sealed closed by means of transverse seals extending perpendicularly to the tube and subsequently is separated into bags, wherein preferably exclusively said seals are arranged.

27. Method according to claim 26, wherein for arranging the closing means a strip is supplied in the longitudinal direction of the tube, which strip is provided with adhesive on both sides.

28. Method according to claim 26 or 27, wherein the closing means is arranged situated at a distance from the outer longitudinal edge of the overlap which is smaller than the distance of the severable, closing seal to said edge.

29. Method according to any one of the claims 26-28, wherein the transverse seals are arranged over the severable, closing seal and the closing means.

30. Method according to any one of the claims 22-29, wherein the tube is formed on a vertical form and fill tube of a form-fill-seal machine, wherein the form tube gives the tube a substantially rectangular cross-section, of which the one, first main side faces away from the machine and the other, second main side faces the machine, wherein the transverse seals are arranged by means of transverse sealing jaws which in a vertical plane are moved transverse to the plane of the both main sides, wherein preferably the overlap is arranged at the first main side.

31. Packaging for a mass of articles, such as sweets, viscous material, such as salad, wherein the packaging is bag-shaped and manufactured from a web of foil material which from a flat condition has been bent into a tube shape having an overlap and after that in filled condition is cut into (tube) sections for separating the manufactured packaging, wherein the packaging at the cutting edges of the section in question is sealed closed for forming side edges, wherein the packaging has two main sides and a bottom area, which extends perpendicular to the side edges and forms two bottom edges which between them define an inwardly folded bottom strip and each with a connecting main side of the packaging form a sealed bottom seam, wherein the overlap extends over a main side and at a distance from its end edge is sealed to said main side by means of a closed but severable seal, and wherein the packaging at the location of the overlap is provided with means that enable repeated opening and closing of the packaging.

32. Packaging according to claim 31, wherein the bottom longitudinal seals and the transverse seals overlap each other in the corner areas that form the boundary of the inside of the packaging. 5
33. Packaging according to claim 31 or 32, wherein the means that enable repeated opening and closing of the packaging are situated between the severable longitudinal seal and the outer longitudinal edge of the overlap. 10
34. Packaging according to claim 31, 32 or 33, wherein the means that enable repeated opening and closing of the packaging are formed by a strip of doublesided adhesive, preferably provided with a detachable protective strip. 15
35. Packaging according to any one of the claims 31-34, wherein the foil material is a laminate having situated at both its outer sides respective first and second layers of different synthetic material, wherein at the location of the severable longitudinal seal the first material is attached to the second material. 20
36. Form-fill-seal machine according to any one of the claims 1-21, designed as a continuously operative machine. 25
37. Form-fill-seal machine according to any one of the claims 1-21, designed as a step-wise or discontinuously operative machine. 30

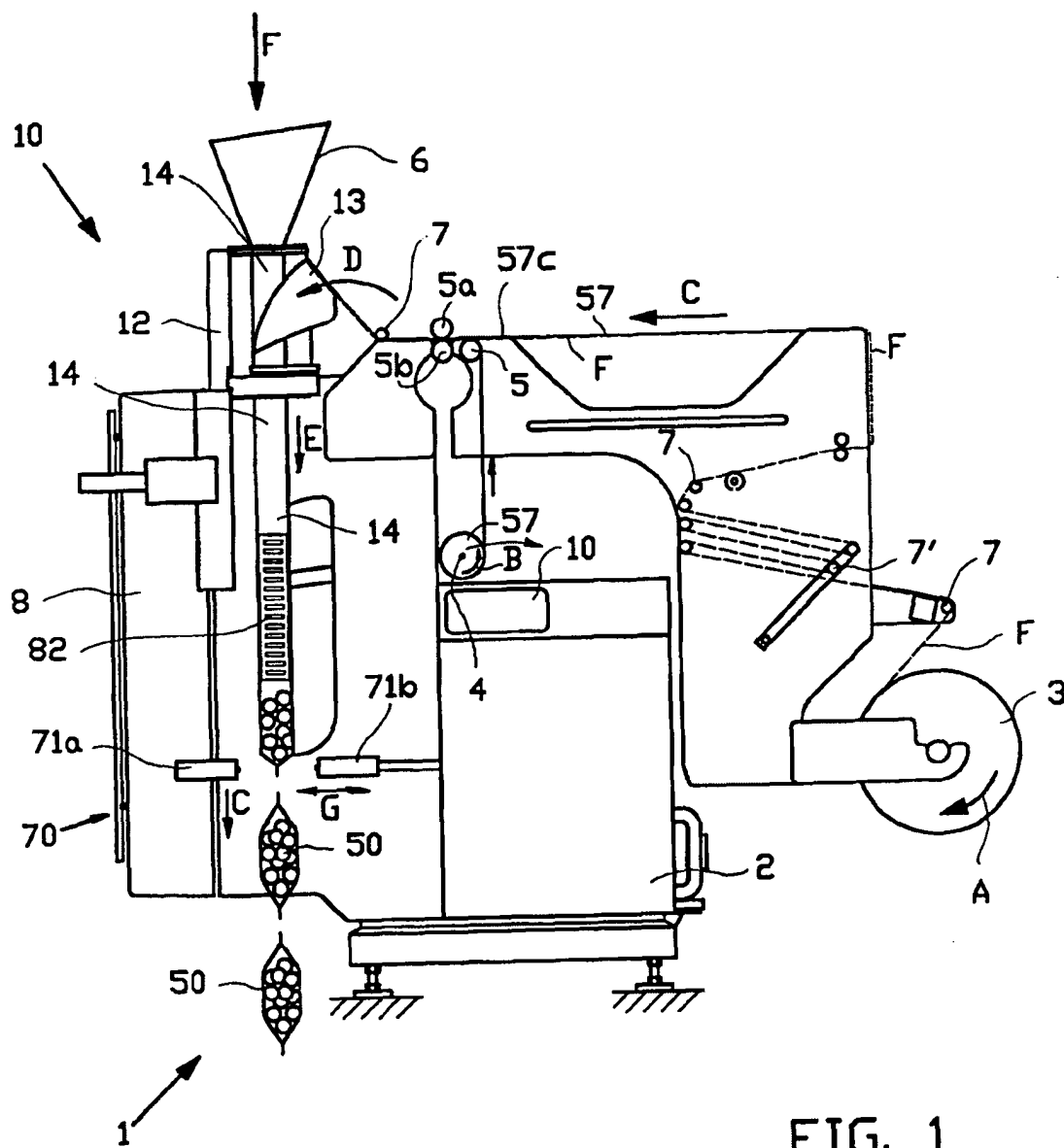
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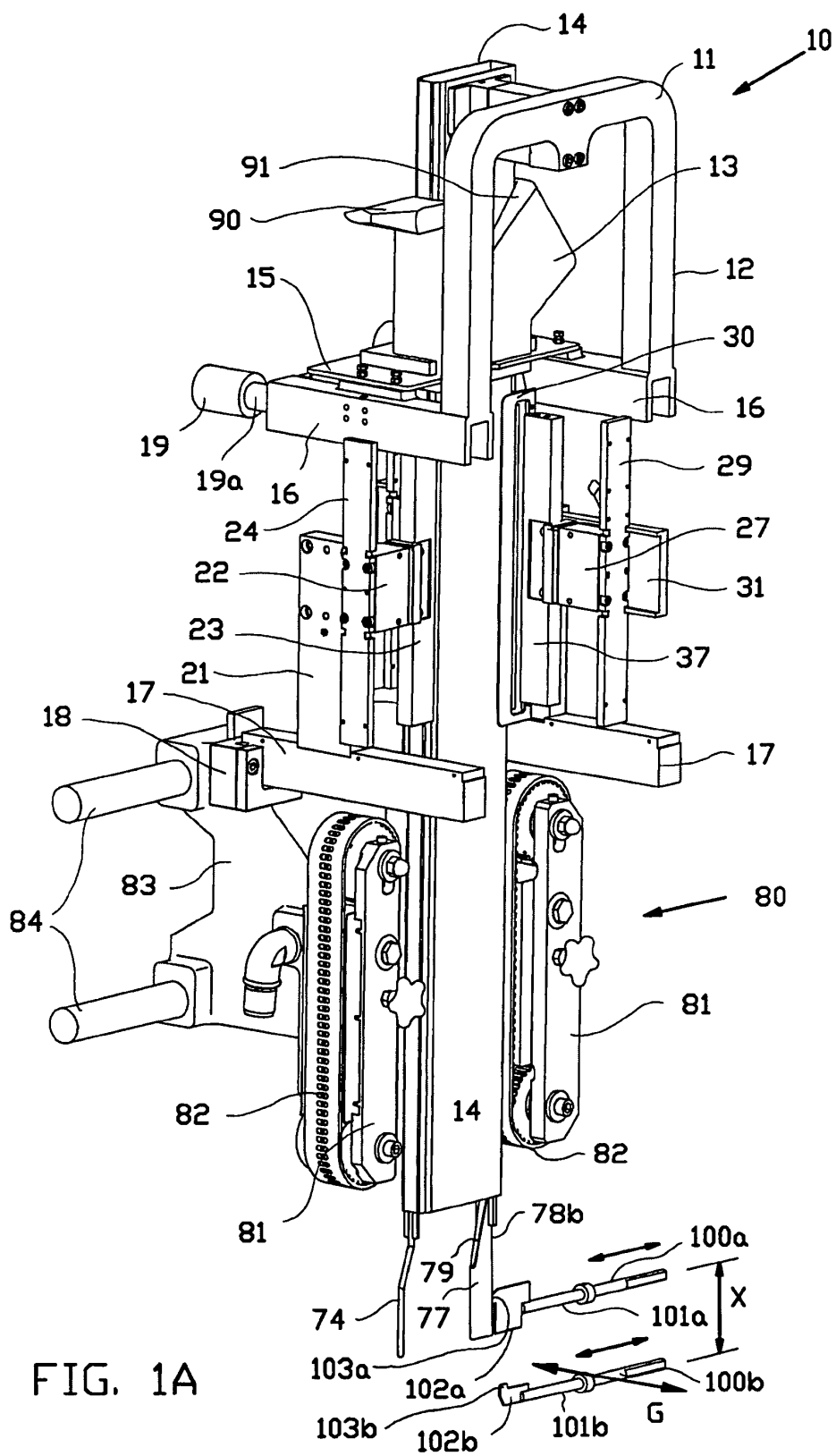
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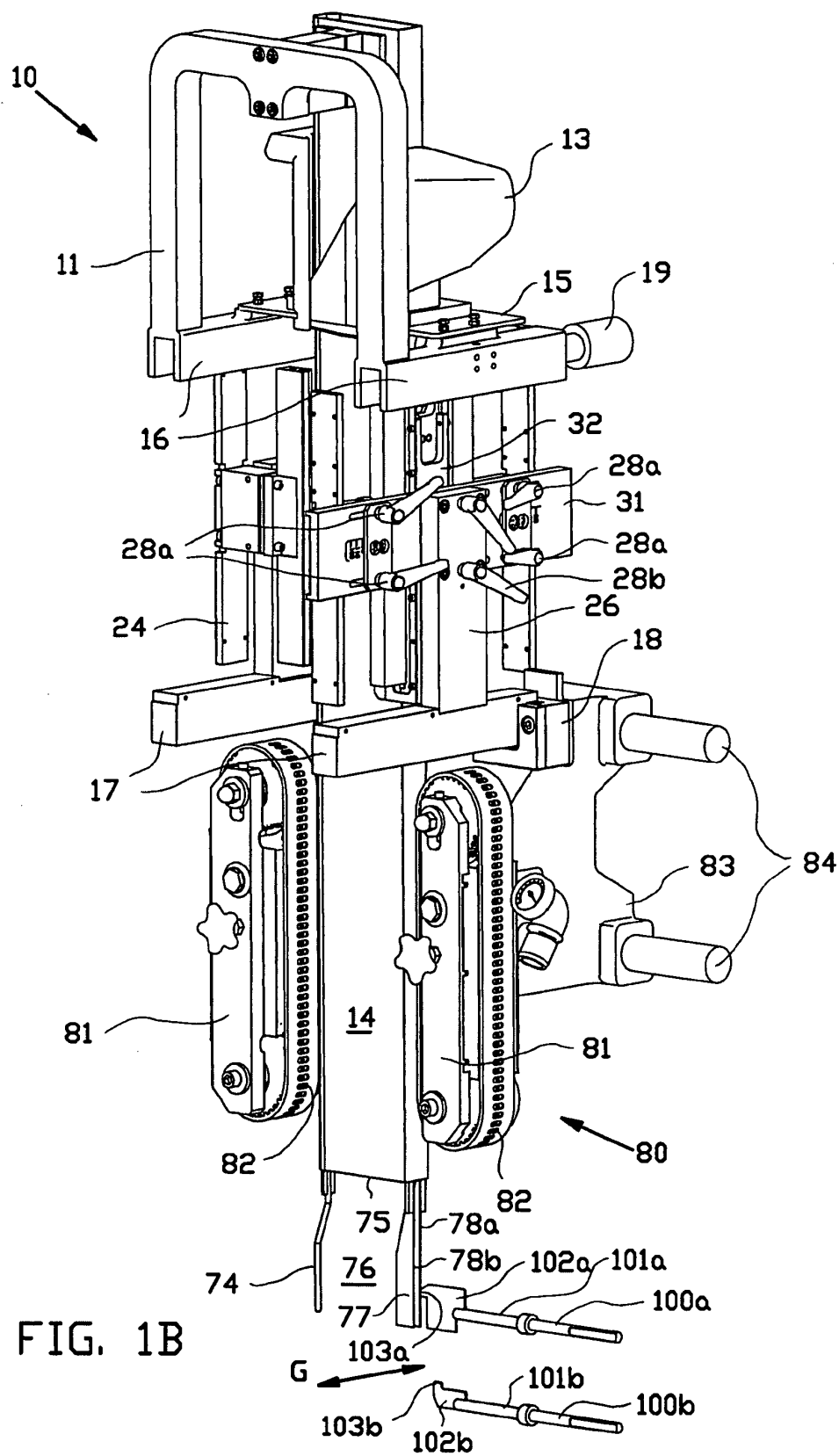
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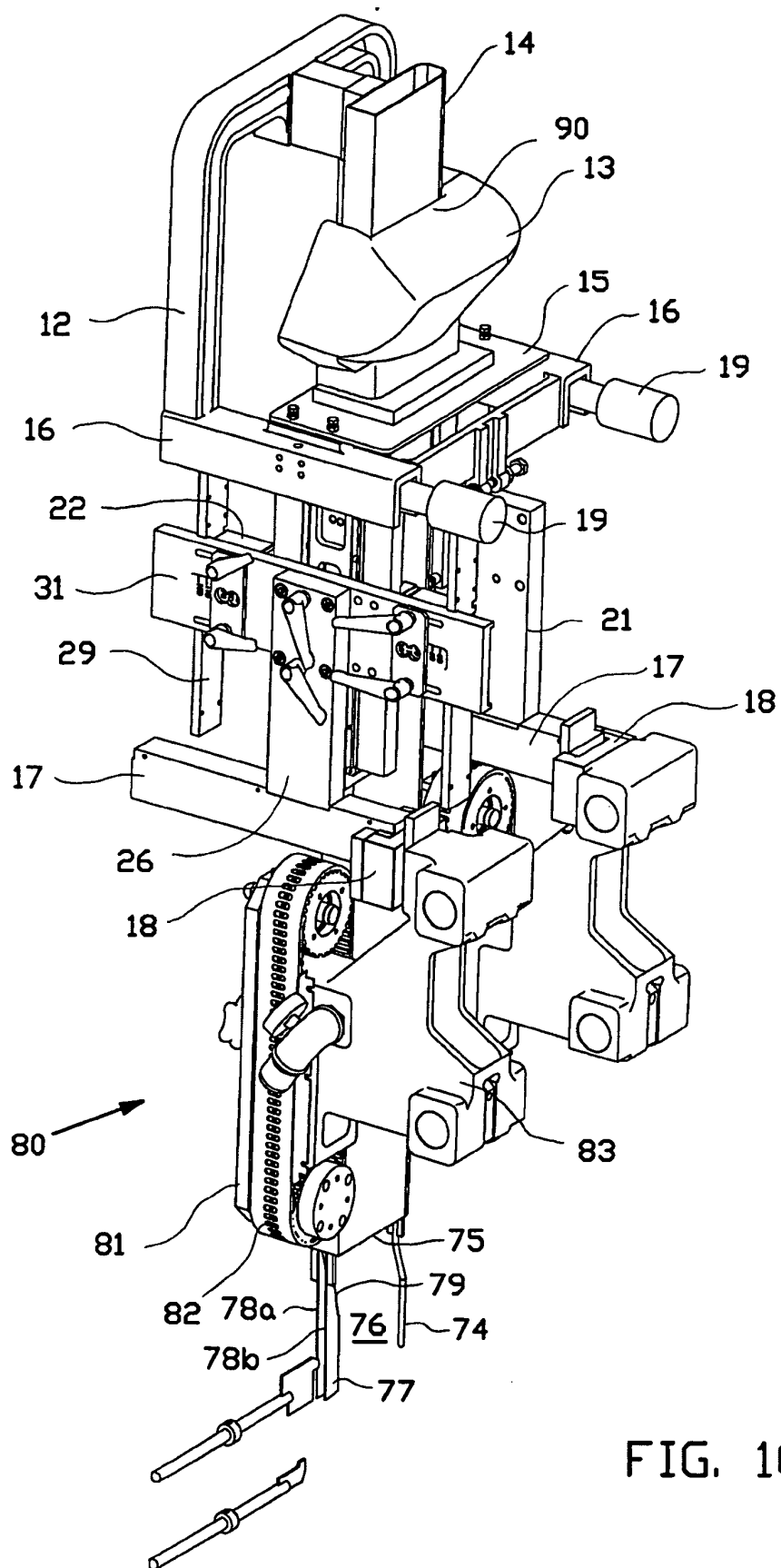


FIG. 1C

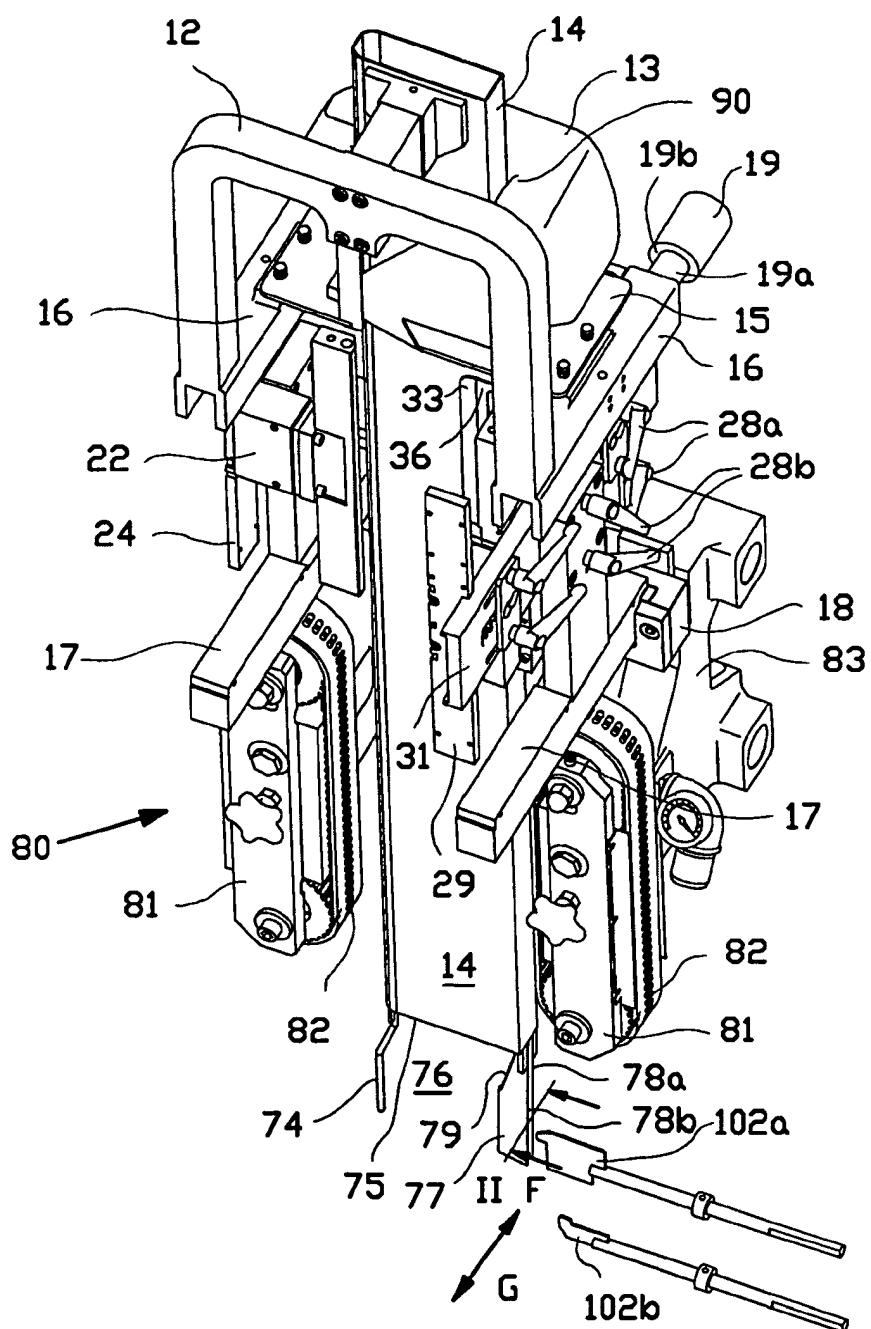


FIG. 1D

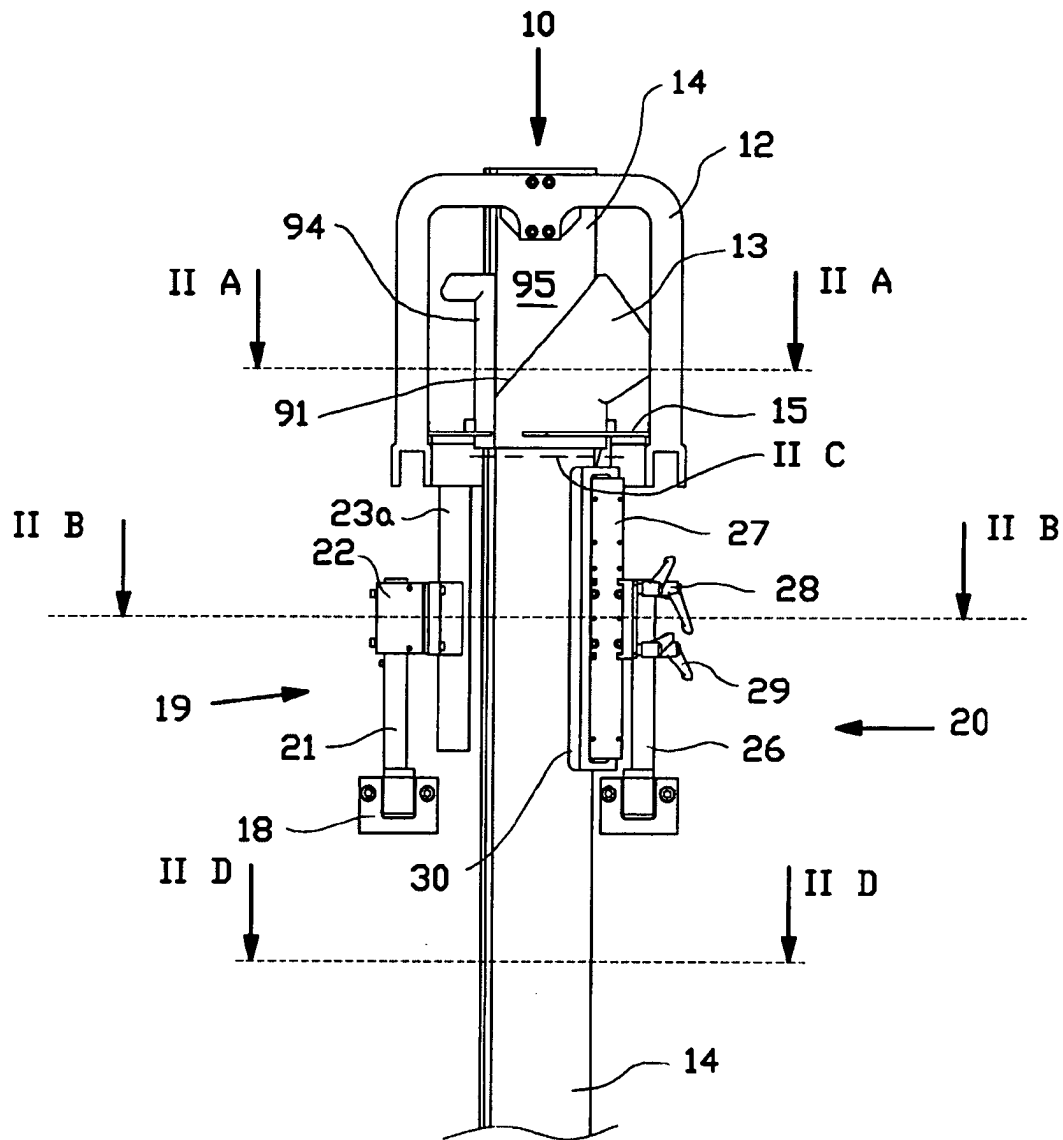


FIG. 1E

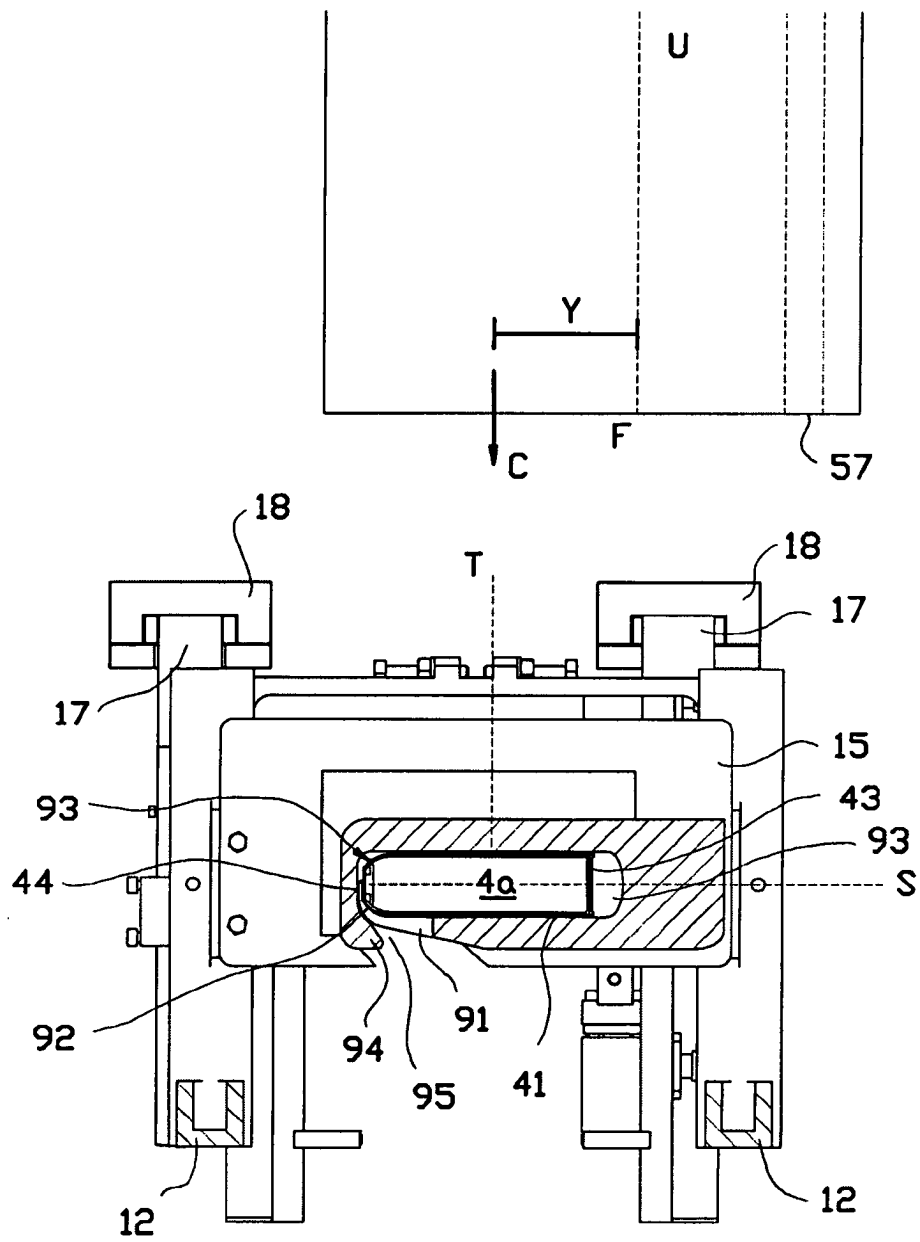


FIG. 2A

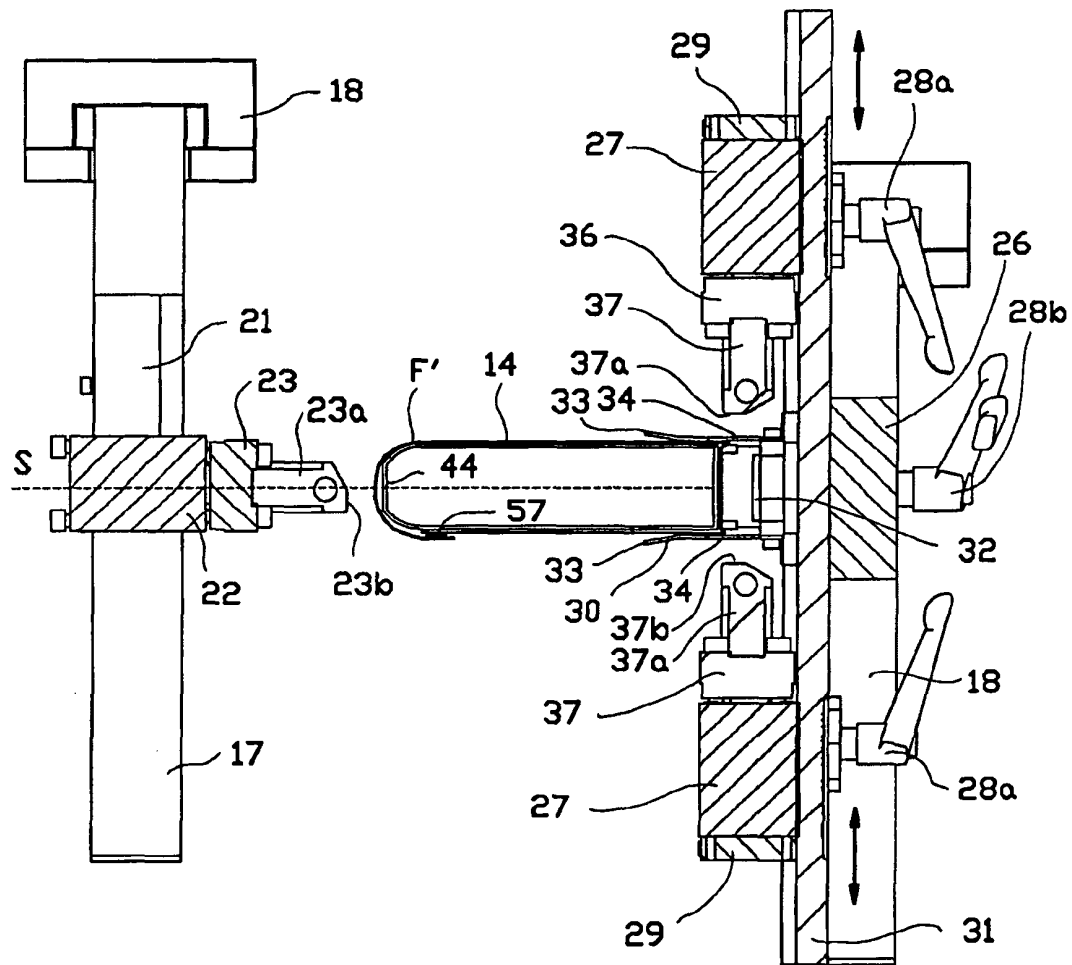


FIG. 2B

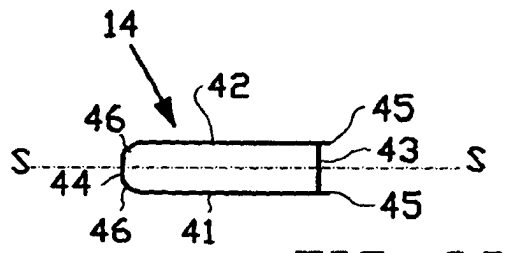


FIG. 2C

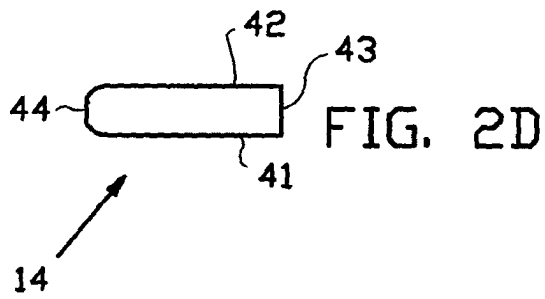


FIG. 2D

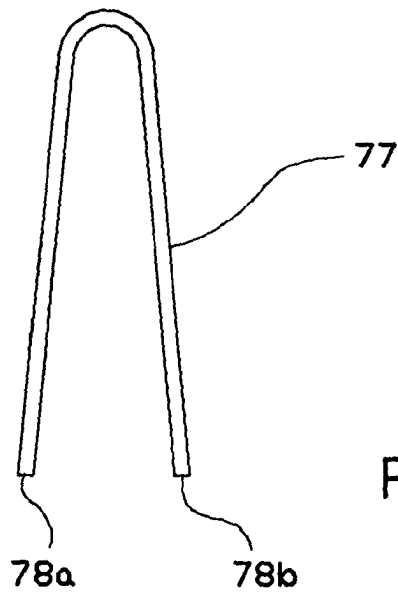
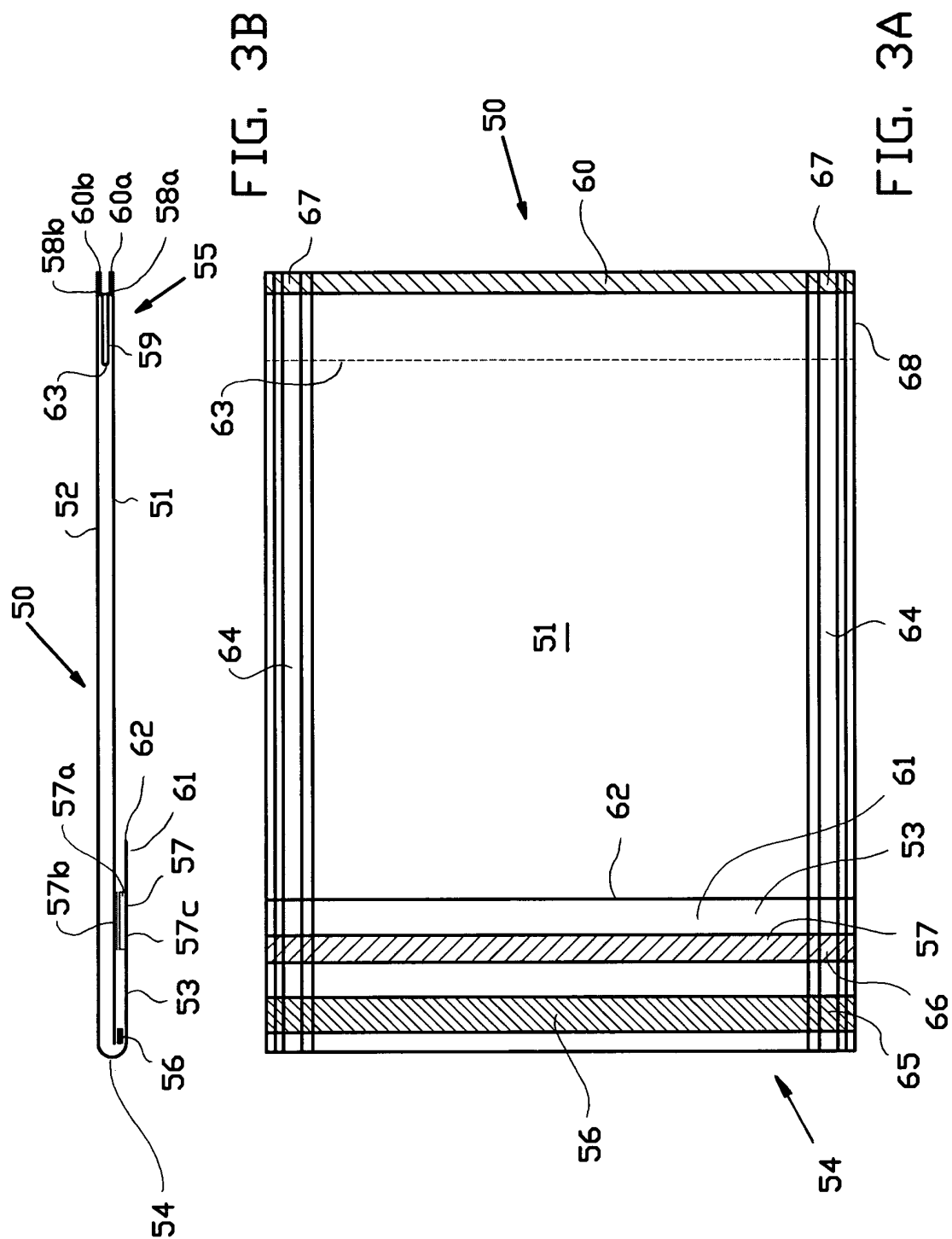


FIG. 2E



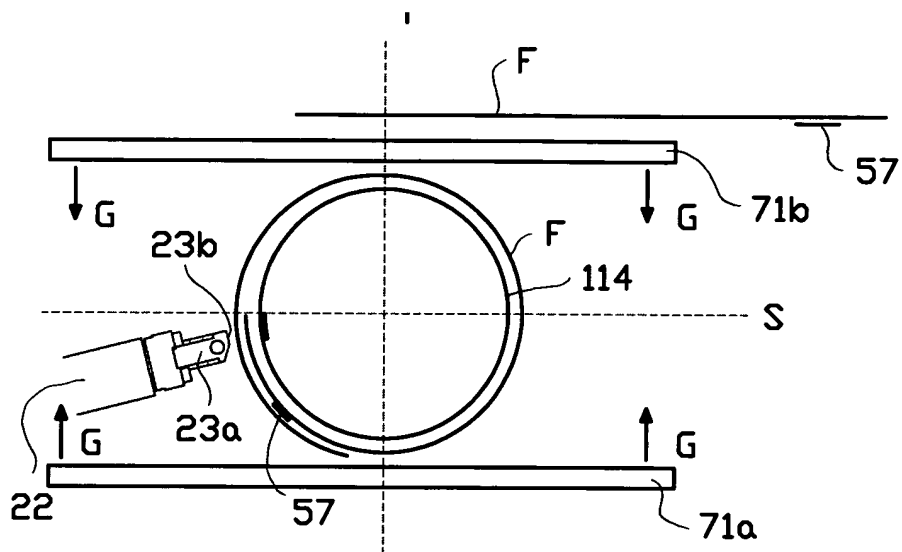


FIG. 2F

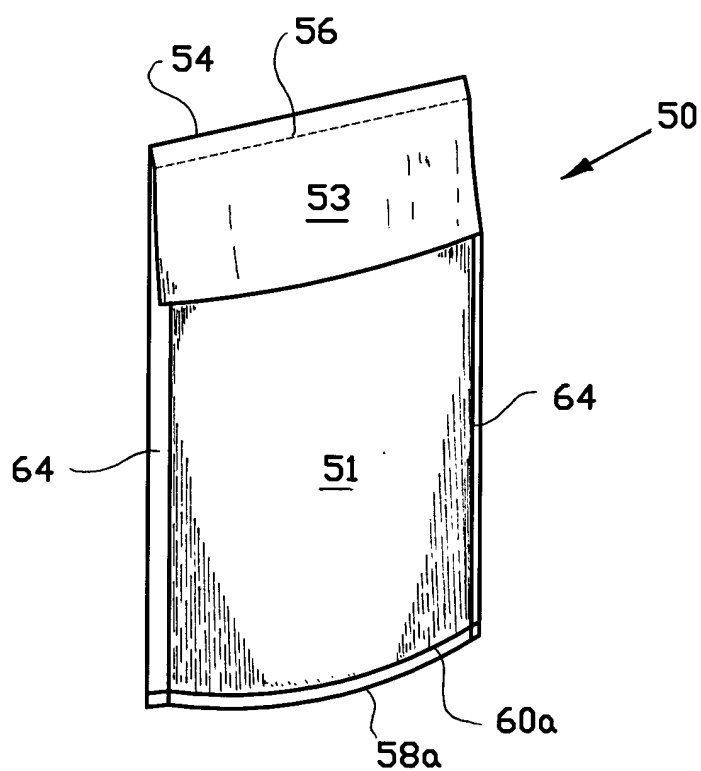


FIG. 3C



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Application Number
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