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(54) **A DRAWER ADAPTED TO CONTAIN A GROUP OF SMOKING ARTICLES AND A COLLAR, METHOD FOR FEEDING A GROUP OF SMOKING ARTICLES AND A COLLAR TO THE DRAWER, AND A PACKING MACHINE FOR SMOKING ARTICLES PROVIDED WITH A WRAPPING CONVEYOR PROVIDED WITH THE DRAWER**

TASCHE FÜR EINE GRUPPE RÄUCHERGEGENSTÄNDE UND EINEM KRAGEN, VERFAHREN ZUM ZUFÜHREN EINER GRUPPE RÄUCHERGEGENSTÄNDE ZUSAMMEN MIT DEM KRAGEN, UND VERPACKUNGSMASCHINE MIT EINEM TASCHENFÖRDERER

TIROIR CONÇU POUR CONTENIR UN GROUPE D'ARTICLES À FUMER ET UN COLLIER, PROCÉDÉ POUR ALIMENTER UN GROUPE D'ARTICLES À FUMER ET UN COLLIER POUR LE TIROIR, ET MACHINE À EMBALLER LES ARTICLES À FUMER DOTÉE D'UN CONVOYEUR D'ENROBAGE ÉQUIPÉ DU TIROIR

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EP 3 814 236 B1

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DescriptionTECHNICAL FIELD

[0001] The present invention relates to a drawer adapted to contain a group of smoking articles and a collar, to a method for feeding a group of smoking articles and a collar to the drawer, and to a packing machine for smoking articles provided with a wrapping conveyor provided with the drawer.

[0002] The present invention finds application in the manufacturing of packets of cigarettes, to which the following description will make explicit reference without thereby losing generality.

PRIOR ART

[0003] A packet of cigarettes comprises a wrap, which is formed by a group of cigarettes wrapped in a wrapping sheet, and an outer casing, which is generally formed by a rigid box with a hinged lid obtained by folding a rigid blank around the wrap.

[0004] When the wrap is sealed and has a cigarette extraction opening at the top and in front, closed by a reusable closing label, inside the wrap (in direct contact with the cigarettes) usually a "U"-shaped collar is provided. In this case the feeding of the collar is complex as the collar must be arranged and kept in a precise position in contact with the group of cigarettes without being glued to the group of cigarettes (among other things, the group of cigarettes does not provide a uniform support surface and does not have a stable shape); in fact, only the subsequent folding of the wrapping sheet around the group of cigarettes stabilizes the position of the collar.

[0005] The patent application EP2008935A1 describes a method for coupling an insert (e.g. a collar) to a group of cigarettes: the group of cigarettes is fed to a first seat of a pocket, the which first seat is adapted to contain the group of cigarettes, the insert (collar) is fed to a second seat of the pocket, the which second seat is adapted to contain the insert (collar) and is separate from the first seat; and the group of cigarettes and the insert (collar) are extracted from the pocket, together, by means of a single common extractor device so as to couple the insert (collar) to the group of cigarettes.

[0006] The method proposed in the patent application EP2008935A1, however has the drawback of requiring the insertion of the collar (which is an incompressible and deformable body) into the second seat of the pocket in which the collar enters with little clearance; consequently, the feeding of the collar into the second seat of the pocket requires great precision in the positioning of the collar and great control in the conformation of the collar. Therefore, the feeding of the collar into the second seat of the pocket can become complex when the packing machine reaches a high production rate (normally measured as the number of packets produced per minute).

[0007] Patent application EP1854725A1 describes a

packing machine for packing groups of cigarettes by means of respective collars. The packing machine comprises a plurality of rigid wrapping pockets, each of which has a substantially tubular first portion and a second portion aligned with the first portion, which is "C"-shaped with concavity facing outwards; each wrapping pocket is fed through a first loading station, in which a "U"-folded collar is fed into the second portion of the wrapping pocket, and then through a second loading station, in which a group of wrapped cigarettes is axially fed into the wrapping pocket through the first portion of the wrapping pocket and until reaching a temporary relative position with respect to the collar, and finally through an unloading station, in which an axial movement is imparted to the group of wrapped cigarettes with respect to the collar so as to arrange the group of wrapped cigarettes in a final relative position with respect to the collar.

DESCRIPTION OF THE INVENTION

[0008] The object of the present invention is to provide a drawer adapted to contain a group of smoking articles and a collar, a method for feeding a group of smoking articles and a collar to the drawer, and a packing machine for smoking articles provided with a wrapping conveyor provided with the drawer, the which drawer, feeding method and packing machine are free from the drawbacks described above and, at the same time, are simple and inexpensive to implement.

[0009] According to the present invention a drawer adapted to contain a group of smoking articles and a collar, a method for feeding a group of smoking articles and a collar to the drawer, and a packing machine for smoking articles provided with a wrapping conveyor provided with the drawer, are provided as claimed in the attached claims.

[0010] The claims describe embodiments of the present invention forming an integral part of the present description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will now be described with reference to the attached drawings, which illustrate a non-limiting embodiment example thereof, wherein:

- Figure 1 is a front perspective view and in a closed configuration of a packet of cigarettes made according to the present invention;
- Figure 2 is a rear perspective view of the packet of cigarettes of Figure 1 in a closed configuration;
- Figure 3 is a front perspective view of the packet of cigarettes of Figure 1 in an open configuration;
- Figure 4 is a front perspective view of a wrap of the packet of Figure 1 in a closed configuration;
- Figure 5 is a perspective view of a group of cigarettes enclosed in the wrap of Figure 4;
- Figure 6 is a perspective view of a collar coupled to

- the group of cigarettes of Figure 5 and enclosed in the wrap of Figure 4;
- Figure 7 is a plan view of a heat-sealable wrapping sheet used to make the wrap of Figure 4;
 - Figure 8 is a perspective and schematic view of part of a cigarette packing machine which is adapted to produce the wrap of Figure 4;
 - Figure 9 is a perspective and schematic view of a variant of the cigarette packing machine of Figure 8;
 - Figure 10 is a longitudinal section view of a drawer of a wrapping conveyor of the cigarette packing machine of Figure 8;
 - Figure 11 is a front view of the drawer of Figure 10;
 - Figure 12 is a perspective view with the extraction of an upper wall of part of the drawer of Figure 10;
 - Figures 13a-13g illustrate, in sequence, the feeding of the collar of Figure 6, of the group of cigarettes of Figure 5, and of the wrapping sheet of Figure 7 to the drawer of Figure 10;
 - Figures 14a-14b illustrate two different possibilities for housing the group of cigarettes of Figure 5 inside the drawer of Figure 10;
 - Figure 15 is a longitudinal section view of a variant of the drawer of Figure 10;
 - Figure 16 is a longitudinal section view and on an enlarged scale of a detail of a variant of the drawer of Figure 10; and
 - Figure 17 is a longitudinal section and on an enlarged scale of a detail of a further variant of the drawer of Figure 10.

PREFERRED EMBODIMENTS OF THE INVENTION

[0012] In Figures 1, 2 and 3 number 1 denotes as a whole a rigid packet of cigarettes. The packet 1 of cigarettes comprises a cup-shaped outer container 2 made of cardboard or rigid paperboard and a sealed wrap 3 (better illustrated in Figure 8) housed inside the container 2.

[0013] The outer container 2 has an open upper end and is provided with a lid 4, which is cup-shaped and is hinged to the outer container 2 along a hinge 5 (illustrated in Figure 2) to rotate, with respect to the outer container 2, between an open position (illustrated in Figure 3) and a closed position (illustrated in Figures 1 and 2) of the open upper end.

[0014] The sealed wrap 3 encloses a group 6 of cigarettes (partially illustrated in Figure 3 and completely illustrated in Figure 5) of a parallelepiped shape; moreover, the sealed wrap 3 has a cigarette extraction opening 7 at the top and in front, closed by a reusable closing label 8.

[0015] The sealed wrap 3 comprises a collar 9, i.e. a reinforcing element (illustrated in Figure 6), which is made of cardboard or rigid paperboard (completely similar to the cardboard or rigid paperboard forming the outer container 2), is "U"-shaped and is arranged inside the sealed wrap 3 in contact with the group 6 of cigarettes.

The collar 9 comprises a rectangular-shaped front wall 10, which is arranged in contact with a front wall of the group 6 of cigarettes and a pair of side walls 11, which are connected to the opposite sides of the front wall 10 and are arranged in contact with the side walls of the group 6 of cigarettes. The front wall 10 has a window that is arranged on the upper part, and is delimited by an edge 12, having a "U"-shape, and facilitates the extraction of cigarettes from the group 6 of cigarettes as it exposes an upper area of the front wall of the group 6 of cigarettes.

[0016] The function of the collar 9 is to confer greater rigidity and greater shape stability to the sealed wrap 3 so as to prevent the sealed wrap 3 from collapsing in on itself after having extracted some of the cigarettes contained in the sealed wrap 3, thus making the extraction of the remaining cigarettes complicated and in particular making the opening and subsequent re-closing of the closing label 8 extremely complicated. A further function of the collar 9 is to provide an adequate mechanical protection for the cigarettes during the forming and handling of the sealed wrap 3. Finally, another function of the collar 9 is to keep the lid 4 in the closed position, since, in order for the lid 4 to pass from the closed position to the open position (and vice versa) it must slightly deform the upper and front part of the collar 9 in an elastic manner.

[0017] It is understood that the collar 9 may have different conformations with respect to what is illustrated in Figure 6. For example, the collar 9 may have a bottom wall or may have side walls 11 having a height lower than the height of the front wall 10.

[0018] As illustrated in Figure 7, the sealed wrap 3 is obtained by folding a heat-sealable wrapping sheet 13, which has a rectangular shape, is folded around the group 6 of cigarettes and, once folded, is stabilized by heat-sealing (i.e. overlapping portions of the wrapping sheet 13 are connected to one another, in a stable way, by heat-sealing). The wrapping sheet 13 has a "U"-shaped incision and defines the extraction opening 7 for the sealed wrap 3; moreover, the closing label 8 that completely covers the incision (i.e. the extraction opening 7) is glued to the wrapping sheet 13.

[0019] In Figure 8, number 14 denotes as a whole a part of a packing machine which manufactures the packet 1 of cigarettes described above; in particular, Figure 8 illustrates a first part of the packing machine 14 in which the sealed wrap 3 is made by folding a wrapping sheet 13 around a group 6 of cigarettes coupled to a collar 9 and downstream of the first part a second part (known and not illustrated) is arranged in which a box with a hinged lid is formed around the sealed wrap 3 by folding a rigid blank around the sealed wrap 3.

[0020] The packing machine 14 comprises a forming unit 15 in which the groups 6 of cigarettes coupled to corresponding collars 9 are formed in succession, a preliminary folding unit 16 in which a corresponding wrapping sheet 13 is folded in a "U"-shape around each group 6 of cigarettes, a transverse folding unit 17 in which each wrapping sheet 13 is transversely folded at a bottom wall

of the respective group 6 of cigarettes so as to form a tubular wrap, and a longitudinal folding unit 18 in which each wrapping sheet 13 is longitudinally folded at the side walls of the respective group 6 of cigarettes to complete the formation of the sealed wrap 3.

[0021] The packing machine 14 comprises a wrapping conveyor 19, which comprises a plurality of drawers 20 (one of which is illustrated in Figures 10-12) which are adapted to house corresponding groups 6 of cigarettes and collars 9 and are step-fed (that is, with a law of motion which cyclically alternates a movement step and a rest step) along a wrapping path P1 which crosses the forming unit 15 and the preliminary folding unit 16.

[0022] According to a preferred (but not binding) embodiment, each drawer 20 of the wrapping conveyor 19 forms a hollow folding mandrel, around which the wrapping sheet 13 is folded in a "U"-shape; in other words, a wrapping sheet 13 is initially folded in a "U"-shape around a drawer 20 of the wrapping conveyor 19 which contains a group 6 of cigarettes coupled to a collar 9 and subsequently the group 6 of cigarettes coupled to the collar 9 is inserted into the "U"-folded wrapping sheet 13 when it is extracted from the drawer 20.

[0023] Preferably, the drawers 20 project in a cantilever manner from the wrapping conveyor 19, i.e. each drawer 20 is fixed to the wrapping conveyor 19 only at a first end and a second end opposite to the first end is free from constraints with the wrapping conveyor 19 and relatively far away from the wrapping conveyor 19.

[0024] In the non-limiting embodiment illustrated in the attached Figures, the wrapping conveyor 19 comprises a belt, which is wound around end pulleys (one of which is motorized) and step-moves along a closed loop path; alternatively, the wrapping conveyor 19 comprises a wheel mounted rotatable about a central rotation axis.

[0025] A feeding station S1 is arranged along the wrapping path P1 in which a collar 9 is fed to each drawer 20 by entering the drawer 20 in a direction D1. Along the wrapping path P1 and downstream of the feeding station S1 a feeding station S2 is arranged, in which a group 6 of cigarettes is fed into the same drawer 20 in a direction D2 opposite to the direction D1; in particular, the forming unit 15 comprises a hopper (schematically illustrated) which is arranged at the feeding station S2 and is provided with four outlet mouths for simultaneously feeding four groups 6 of cigarettes to respective drawers 20 of the wrapping conveyor 19 that step-moves along the wrapping path P1.

[0026] The preliminary folding unit 16 is arranged along the wrapping conveyor 19 (i.e. along the wrapping path P1) downstream of the forming unit 15. In the preliminary folding unit 16 and at a feeding station S3, each drawer 20 is coupled to a corresponding wrapping sheet 13 which is folded in a "U"-shape around the drawer 20 (containing a group 6 of cigarettes and a collar 9).

[0027] The transverse folding unit 17 comprises a wrapping conveyor 21, which receives, in succession, the sealed wraps 3 being formed (each formed by a wrap-

ping sheet 13 which is folded in a "U"-shape" around a corresponding group 6 of cigarettes coupled to a collar 9) from the wrapping conveyor 19 in a transfer station S4 and feeds in succession the sealed wraps 3 being formed along a circular folding path P2. In other words, in the feeding station S3 a wrapping sheet 13 is folded in a "U"-shape" around a drawer 20 (containing a group 6 of cigarettes coupled to a collar 9) and then, in the transfer station S4, the group 6 of cigarettes coupled to the collar 9, coming out of the drawer 20, enters in the wrapping sheet 13 folded in a "U"-shape bringing therewith the wrapping sheet 13 folded in a "U"-shape.

[0028] The wrapping conveyor 21 comprises a wrapping wheel 22 which step-rotates (that is, with a law of motion which cyclically alternates a movement step and a rest step) about a central rotation axis 23 and is provided with a plurality of peripheral pockets each adapted to house a corresponding sealed wrap 3 being formed (i.e. a group 6 of cigarettes coupled to a collar 9 and partially wrapped in a wrapping sheet 13). The transverse folding unit 17 comprises folding devices (known and not illustrated) which fold the wrapping sheet 13 in a known manner to give the wrapping sheet 13 a tubular shape. The transverse folding unit 17 further comprises welding devices (known and not illustrated) which stabilize each wrapping sheet 13 of a tubular shape by heat-sealing.

[0029] At the end of the transverse folding unit 17 (i.e. at the inlet of the longitudinal folding unit 18) each wrapping sheet 13 has a tubular shape having two side edges open at the side walls of the group 6 of cigarettes. The longitudinal folding unit 18 comprises a wrapping conveyor (known and not illustrated), which receives, in succession, the sealed wraps 3 being formed (each formed by a wrapping sheet 13 folded in a tubular shape around a corresponding group 6 of cigarettes coupled to a collar 9) from the longitudinal wrapping conveyor 21 in a transfer station S5 and advances along a folding path P3 which is rectilinear and is arranged perpendicularly to the folding path P2. The transfer station S5 is opposite to the transfer station S4 and is arranged at 180° along the wrapping path P2 with respect to the transfer station S4. The longitudinal folding unit 18 comprises folding devices (known and not illustrated) which fold in a known manner the two open side edges of each tubular-shaped wrapping sheet 13 to complete the formation of the sealed wrap 3; preferably, the folding devices of the longitudinal folding unit 18 are passive (i.e. they are completely free of moving parts) and comprise only fixed folding helices. The longitudinal folding unit 18 further comprises welding devices (known and not illustrated) which stabilize each sealed wrap 3 by heat-sealing overlapping portions of the wrapping sheet 13 at the side walls of the group 6 of cigarettes.

[0030] As illustrated in Figure 8, the preliminary folding unit 16 comprises a feeding conveyor, which feeds the wrapping sheets 13 in succession along a rectilinear feeding path P4; by way of example, the feeding conveyor comprises two conveyor belts which are closed in a loop,

are arranged at opposite ends of the wrapping sheets 13, and hold the wrapping sheets 13 by suction. The feeding path P4 has a segment parallel to and side-by-side with the wrapping path P1 at the feeding station S3 in which each wrapping sheet 13 is transferred from the feeding conveyor to a drawer 20 of the wrapping conveyor 19 to be coupled, as described above, to the drawer 20. A wrapping device (known and not illustrated) is coupled to the wrapping conveyor 19, which folds the wrapping sheet 13 in a "U"-shape around the drawer 20 as previously described.

[0031] According to an alternative and perfectly equivalent embodiment not illustrated, each wrapping sheet 13 is fed flat at the transfer station S4 and folds in a "U"-shape around the group 6 of cigarettes coupled to a collar 9 while the group 6 cigarettes enters a pocket of the wrapping wheel 22; in other words, in this embodiment each drawer 20 is not a mandrel around which the wrapping sheet 13 is folded, but the wrapping sheet 13 is fed downstream of the drawer 20 without touching the drawer 20. Figure 9 illustrates a variant of the packing machine 14 illustrated in Figure 8. In particular, in the packing machine 14 illustrated in Figure 9, the wrapping conveyor 19 is completely rectilinear and also the wrapping conveyor 21 is rectilinear. Moreover, in the preliminary folding unit 16 of the packing machine 14 illustrated in Figure 8, the wrapping sheet 13 initially has a more open shape forming a folding angle greater than 90° and therefore assumes its final shape when the group 6 of cigarettes coupled to a collar 9 leaves the corresponding drawer 20 of the wrapping conveyor 19 together with the wrapping sheet 13; instead, in the preliminary folding unit 16 of the packing machine 14 illustrated in Figure 9, the wrapping sheet 13 immediately assumes the final shape already when it is folded around a drawer 20 of the wrapping conveyor 19.

[0032] In the non-limiting embodiment illustrated in the attached figures, the longitudinal folding unit 18 comprises a rectilinear wrapping conveyor having pushers which feed the sealed wraps 3 through a fixed folding tunnel; alternatively, the longitudinal folding unit 18 comprises a circular wrapping conveyor (i.e. a wrapping wheel mounted rotatable about a central rotation axis).

[0033] As illustrated in Figures 10, 11 and 12, each drawer 20 (adapted to contain a group 6 of cigarettes and a collar 9) has a pocket 24 which has a tubular shape that develops around a longitudinal axis and a rectangular cross-section, is adapted to house the group 6 of cigarettes and the collar 9, and has an opening 25 through which the group 6 of cigarettes is axially inserted (i.e. parallel to the longitudinal axis of the pocket 24 and parallel to the longitudinal axes of the cigarettes) and an opening 26 opposite to the opening 25 through which the collar 9 is initially axially inserted (i.e. parallel to the longitudinal axis of the pocket 24) and subsequently the group 6 of cigarettes and the collar 9 are axially extracted (i.e. parallel to the longitudinal axis of the pocket 24 and parallel to the longitudinal axes of the cigarettes) and

together with the drawer 20.

[0034] In the embodiment illustrated in the attached figures, the pocket 24 of each drawer 20 has a rectangular cross-section; in general, the shape of the pocket 24 assumes the shape of the group 6 of cigarettes and therefore if the group 6 of cigarettes had a non-rectangular cross-section (e.g. triangular or trapezoidal) also the pocket 24 would have a non-rectangular cross-section (e.g. triangular or trapezoidal).

[0035] Each pocket 24 is bounded by: a bottom wall 27 on which the collar 9 rests (in particular the front wall 10 of the collar 9), two side walls 28 parallel and opposite to one another and perpendicular to the bottom wall 27 on which the collar 9 rests (in particular the side walls 11 of the collar), and an upper wall 29 which is parallel and opposite to the bottom wall 27. The upper wall 29 has a thickness smaller than the other walls 27 and 28 and is centrally crossed by a slit 30 through which a control rod of a pusher can pass, which extracts the group 6 of cigarettes coupled to the collar 9 from the pocket 24 of the drawer 20.

[0036] In each drawer 20, the bottom wall 27 of the pocket 24 has a step 31, which is arranged close to (at) the opening 25, locally reduces the size of the pocket 24, and has a thickness equal to at least the corresponding thickness of the collar 9 (in particular of the front wall 10 of the collar 9). In other words, the step 31 is (much) closer to the opening 25 than to the opening 26, i.e. the step 31 is (widely) moved towards the opening 25 and therefore is closer to the opening 25 and further away from the opening 26.

[0037] According to the invention, the step 31 has a thickness slightly greater than the corresponding thickness of the collar 9 to ensure that the step 31 is always slightly higher than the collar 9, net of constructive tolerances and positioning inaccuracies. For example, the thickness of the collar 9 generally ranges from 0.3 mm to 0.5 mm and the thickness of the step 31 generally ranges from 0.5 to 0.8 mm.

[0038] According to the preferred, but not binding, embodiment illustrated in the attached figures, also the side walls 28 of the pocket 24 have two steps 32 which are the natural continuation of the step 31 (as is clearly illustrated in Figure 12) and are completely similar to the step 31; consequently, each step 32 is arranged close to (at) the opening 25, locally reduces the size of the pocket 24, and has a thickness equal to at least the corresponding thickness of the collar 9 (in particular of the side walls 11 of the collar 9).

[0039] According to a possible embodiment illustrated in Figures 10, 11 and 12, the steps 31 and 32 each have inside the pocket 24 a respective inner wall, which projects from the bottom wall 27 or from the side walls 28 of the pocket 24, is flat, and is perpendicular to the bottom wall 27 or to the side walls 28 of the pocket 24. According to a variant illustrated in Figure 16, the steps 31 and 32 each have a respective inner wall inside the pocket 24 which projects from the bottom wall 27 or from

the side walls 28 of the pocket 24, it is flat, and forms an acute angle (equal to 60° according to what is illustrated in Figure 16) with the bottom wall 27 or with the side walls 28 of the pocket 24. According to a further variant illustrated in Figure 17, the steps 31 and 32 each have a respective inner wall inside the pocket 24, which projects from the bottom wall 27 or from the side walls 28 of the pocket 24, and each has a groove having a thickness equal to at least the corresponding thickness of the collar 9.

[0040] According to the possible (but not binding) embodiment illustrated in Figure 15, the bottom wall 27 and the side walls 28 of the pocket 24 are provided with suction to hold the collar 9; in other words, through the walls 27 and 29 of the pocket 24 suction holes 33 are provided which can be connected to a suction source to attract the collar 9 by means of suction (at least between the feeding station S1, in which the collar 9 is inserted into the pocket 24, and the feeding station S2, in which the group 6 of cigarettes is inserted into the pocket 24).

[0041] As better illustrated in Figures 14a-14b, the bottom wall 27 of the pocket 24 (and therefore, consequently, the pocket 24) has an axial size from an edge of the steps 31 and 32 at the opening 26 equal to at least the axial size of the collar 9 (and therefore equal to at least the axial size of the group 6 of cigarettes which is substantially equal to the axial size of the collar 9). In this way, the entire collar 9 can be housed in the pocket 24 upstream of the steps 31 and 32, i.e. between the steps 31 and 32 and the opening 26.

[0042] With reference to Figures 13a-13g, the feeding of a group 6 of cigarettes, a collar 9 and a wrapping sheet 13 with a drawer 20 is described in the following.

[0043] As illustrated in Figures 13a and 13b, at the beginning of the wrapping path P1 the drawer 20 is arranged in the feeding station S1, in which a "U"-shaped collar 9 (as illustrated in Figure 6) is axially fed inside of the pocket 24 entering from the opening 26 and following the direction D1; the collar 9 enters the pocket 24 and is arranged in contact by the head with the steps 31 and 32, i.e. it comes into contact with the steps 31 and 32 (the window of the collar 9 formed in the front wall 10 and bounded by the edge 12 is arranged at the opening 26, or on the opposite side of the steps 31 and 32).

[0044] Subsequently and as illustrated in Figures 13c and 13d, the drawer 20 moves along the wrapping path P1 from the feeding station S1 to the feeding station S2, where a group 6 of cigarettes is axially fed inside the pocket 24 entering from the opening 25 (opposite to opening 26) and following the direction D2 (parallel and opposite to the direction D1); the group 6 of cigarettes enters the pocket 24 moving more on the inside of the steps 31 and 32 and does not "bump" against the collar 9 previously fed (i.e. already present in the pocket 24), since the edge of the collar 9 is "hidden" ("covered") by the steps 31 and 32. In this step, the group 6 of cigarettes can align with the collar 9 (completely by-passing the steps 31 and 32) as illustrated in Figures 13e and 14a,

or the group 6 of cigarettes can remain unaligned with respect to the collar 9 (without completely by-passing the steps 31 and 32) as illustrated in Figure 14b.

[0045] According to the invention, in the feeding station S2 an opposing element 34 is provided which rests against the opening 26 of the pocket 24 when the group 6 of cigarettes is inserted into the pocket 24 through the opening 25 (i.e. in the feeding station S2) to prevent that the entrance of the group 6 of cigarettes into the pocket 24 pushes the collar 9 out of the pocket 24 by the force of friction. According to a possible embodiment, the opposing element 34 is arranged in a fixed position along the wrapping path P1 and therefore it is the drawer 20 which is arranged in front of the opposing element 34 moving along the wrapping path P1; alternatively, the opposing element 34 is movable and rests against the drawer 20 when the drawer 20 reaches the feeding station S2.

[0046] Subsequently, and as illustrated in Figure 13f, the drawer 20 moves along the wrapping path P1 from the feeding station S2 to the feeding station S3, where a wrapping sheet 13 is folded in a "U"-shape around the drawer 20 (whose pocket 24 contains the group 6 of cigarettes and the collar 9); in particular, the wrapping sheet 13 is folded in a "U"-shape around the drawer 20 so that the "U"-folded sheet 13 closes the opening 26 of the pocket 24 and releases the opening 25 of the pocket 24. Finally, and as illustrated in Figure 13g, the drawer 20 moves along the wrapping path P1 from the feeding station S3 to the transfer station S4, in which a pusher enters the pocket 24 from the opening 25 to axially push out, of the pocket 24, the group 6 of cigarettes and the collar 9 coming out of the pocket 24 through the outlet opening 26 and dragging with them the wrapping sheet 13 folded in a "U"-shape. In this way, the group 6 of cigarettes and the collar 9 are inserted into the "U"-folded wrapping sheet 13 when the group 6 of cigarettes and the collar 9 are extracted together from the pocket 24 of the drawer 20 through the opening 26.

[0047] Summing up, only the collar 9 is initially inserted into the pocket 24 of the drawer 20 through the opening 26 (feeding station S1), after the insertion of the collar 9 into the pocket 24 the group 6 of cigarettes is inserted into the pocket 24 (which moves more on the inside of the steps 31 and 32) through the opening 25 (feeding station S2), after the insertion of the group 6 of cigarettes into the pocket 24 the wrapping sheet 13 is folded in a "U"-shape around the drawer 20 (feeding station S3), and finally from the drawer 20 the group 6 of cigarettes and the collar 9 together are extracted through the opening 26, carrying with them the wrapping sheet 13 folded in a "U"-shape (transfer station S4).

[0048] In the embodiment illustrated in the attached Figures, in each drawer 20 the pocket 24 has two grooves 35 which are axially arranged (i.e. parallel to the longitudinal development of the pocket 24), extending over the entire length of the pocket 24 from the opening 25 to the opening 26, are obtained through the side walls 28 and

also cross the corresponding steps 32 (as is clearly illustrated in Figures 11 and 12), and are adapted to be crossed by lateral appendages of a rectangular-shaped pusher 36 (illustrated in broken lines in Figure 11) when the group 6 of cigarettes is extracted from the pocket 24 together with the collar 9. The function of the two grooves 35 is to allow the rectangular-shaped pusher 36 (with its two lateral appendages) to push not only on the group 6 of cigarettes but to push also on the collar 9 so as to extract both of them from the pocket 24. In other words, in the absence of the grooves 35 the pusher could push directly only on the group 6 of cigarettes (i.e. it could not push directly on the collar 9) and therefore the correct extraction of the collar 9 from the pocket 24 would not be guaranteed; instead, the two grooves 35 allow the lateral appendages of the pusher 36 to push directly also on the collar 9 thus ensuring the correct extraction of the collar 9 from the pocket 24. According to a different embodiment, in each drawer 20 the pocket 24 has (at least) one groove formed through the bottom wall 27 and also through the corresponding step 31 and said (at least one) groove is added to the grooves 35 formed in the side walls 28 or, alternatively, it replaces the grooves 35 formed in the side walls 28.

[0049] In the embodiment illustrated in the attached Figures, each pocket 24 has three steps 31 and 32 arranged in a "U"-shape; according to an alternative embodiment not illustrated, each pocket 24 could have only the step 31, only the two steps 32, or a further fourth step formed in the upper wall 29 (this embodiment is normally reserved for the case where the collar 9 has four walls).

[0050] In the embodiment illustrated in the attached Figures, the collar 9 is initially inserted in each pocket 24, through the opening 26, which comes into contact by the head with the steps 31 and 32 (having a thickness at least equal, i.e. preferably slightly thicker, than the corresponding thickness of the collar 9) and then, subsequently, the group 6 of cigarettes is inserted through the opening 25 moving more on the inside of the steps 31 and 32. According to a different embodiment, the feeding of the collar 9 and of the group 6 of cigarettes is inverted and in this case the steps 31 and 32 have a thickness at least equal, or preferably slightly higher, than the corresponding thickness of the group 6 of cigarettes; in other words, according to this different embodiment, the group 6 of cigarettes is initially inserted in each pocket 24, through the opening 26, which comes into contact by the head with the steps 31 and 32 (having a thickness at least equal to, i.e. preferably slightly higher than, the corresponding thickness of the group 6 of cigarettes) and then, subsequently, the collar 9 is inserted through the opening 25 moving more on the inside of the steps 31 and 32.

[0051] According to a possible embodiment, in each pocket 24 the step 31 and/or the steps 32 could be movable to project inside the pocket 24 when the collar 9 and the group 6 of cigarettes are fed and to retract flush with the corresponding walls 27 and 28 when the collar 9 and

the group 6 of cigarettes are extracted.

[0052] In the embodiment illustrated in the attached figures, the collar 9 is preliminarily folded in a "U"-shape (as illustrated in Figure 6) and is then inserted folded in a "U"-shape into the pocket 24 of a drawer 20. According to a different embodiment, not illustrated, the collar 9 is not preliminarily folded in a "U"-shape and is therefore inserted flat (i.e. without folds) into the pocket 24 of a drawer 20; obviously, in this case the collar 9 is subsequently folded in a "U"-shape (as illustrated in Figure 6) after having been extracted from the pocket 24 of the drawer 20.

[0053] In the embodiment illustrated in the attached Figures, each collar 9 is axially inserted into the corresponding pocket 24 through the opening 26 which is opposite to the opening 25 through which the group 6 of cigarettes is axially inserted; i.e. each collar 9 is axially inserted into the corresponding pocket 24 through the opening 26, which is also used to axially extract the group 6 of cigarettes and the collar 9 from the drawer 20 together. In this embodiment, each collar 9 is pushed inside the drawer 20 and through the opening 26 until it (substantially) abuts against the step 31. According to a different embodiment not illustrated, each collar 9 is axially inserted into the corresponding pocket 24 through the opening 25, which is also used to axially (and subsequently) insert the group 6 of cigarettes; in this embodiment, each collar 9 must be pushed inside the drawer 20 and through the opening 25 until it passes the step 31 (i.e. until it reaches beyond the step 31). Axially inserting each collar 9 into the corresponding pocket 24 through the opening 25 is possible, even if more complex, since an upper stroke must be imparted to the collar 9 and since the stroke of the collar 9 cannot be stopped against the step 31 which in this embodiment must be by-passed from above.

[0054] The embodiments described herein can be combined one with the other without departing from the scope of the present claims.

[0055] The packing machine 14 described above has numerous advantages. First of all, the packing machine 14 described above is capable of operating rapidly (i.e. with a high hourly productivity) while ensuring, at the same time, a high and above all constant production quality. This result is achieved thanks to the fact that the insertion of the collars 9 into the pockets 24 of the drawers 20 (at the feeding station S1) can be performed with high precision and without problem even when operating at high speed, since each collar 9 must enter in a very large space (the entire pocket 24) and therefore by entering into the pocket 24 it has wide tolerance margins which allow to compensate without any damage any positioning errors of the collar 9.

[0056] Moreover, the packing machine 14 described above is particularly simple and inexpensive, since, in the pockets 24 of the drawers 20, the forming of the steps 31 and 32 only involves a trivial and fast mechanical machining of the components.

[0057] The embodiment illustrated in the attached figures refers to the manufacturing of a packet of cigarettes, but the present invention is applicable without substantial modifications also to the production of any other type of packet of smoking articles (for example a pack of cigars, a pack of electronic cigarettes of the liquid vaporization type, a new generation pack of cigarettes without tobacco combustion...).

Claims

1. A drawer (20) adapted to contain a group (6) of smoking articles and a collar (9); the drawer (20) comprises a pocket (24), which has a tubular shape, is adapted to house the group (6) of smoking articles and the collar (9), and has a first opening (25), through which the group (6) of smoking articles can be axially inserted, and a second opening (26) opposite to the first opening (25), through which the group (6) of smoking articles and the collar (9) can be extracted from the drawer (20) axially and together;

wherein at least one first wall (27) of the pocket (24) has a first step (31), which is arranged close to the first opening (25), locally reduces the size of the pocket (24), and has a thickness equal to at least the corresponding thickness of the collar (9);

the drawer (20) is **characterized in that** the pocket (24) has at least one groove (35), which extends from the first opening (25) to the second opening (26) and preferably through a corresponding step (32).

2. The drawer (20) according to claim 1, wherein the step (31) has a thickness ranging from 0.5 to 0.8 mm.
3. The drawer (20) according to claim 1 or 2, wherein two second walls (28) of the pocket (24) arranged on opposite sides of the first wall (27) of the pocket (24) have two second steps (32), each arranged close to the first opening (25), locally reducing the size of the pocket (24), and having a thickness equal to at least the corresponding thickness of the collar (9).
4. The drawer (20) according to claim 1, 2 or 3, wherein the step (31) has, inside the pocket (24), an inner wall, which projects from the first wall (27) of the pocket (24), is flat, and forms an acute angle with the first wall (27) of the pocket (24) .
5. The drawer (20) according to claim 1, 2 or 3, wherein the step (31) has, inside the pocket (24), an inner wall, which projects from the first wall (27) of the pocket (24) and has a groove having a thickness equal to at least the corresponding thickness of the

collar (9).

6. The drawer (20) according to one of claims from 1 to 5, wherein the first wall (27) of the pocket (24), provided with the first step (31), is a bottom wall on which the collar (9) rests.

7. A method for feeding a group (6) of smoking articles and a collar (9) to a drawer (20), which is made, for example, according to one of claims from 1 to 6 and comprises a pocket (24), which has a tubular shape and is adapted to house the group (6) of smoking articles and the collar (9); the feeding method comprises the steps of:

axially inserting the collar (9) into the pocket (24);

axially inserting the group (6) of smoking articles into the pocket (24) through a first opening (25); and

extracting the group (6) of smoking articles and the collar (9) from the drawer (20) axially and together through a second opening (26) opposite to the first opening (25);

at least one wall of the pocket (24) has a step (31), which is arranged close to the first opening (25), locally reducing the size of the pocket (24), and has a thickness equal to at least the corresponding thickness of the collar (9); and

the step of inserting the collar (9) into the pocket (24) comprises causing the collar (9) to face the step (31) of the pocket (24) headfirst; the feeding method is **characterized in** comprising the further steps of:

axially inserting the collar (9) into the pocket (24) first through the second opening (26); and

resting an opposing element (34) against the second opening (26) of the pocket (24) when the group (6) of smoking articles is inserted into the pocket (24) through the first opening (25), and wherein the group (6) of smoking articles and the collar (9) are extracted from the drawer (20) together by means of a pusher (36) provided with at least one projecting appendage, which is inserted into a groove (35) of the pocket (24) extending from the first opening (25) to the second opening (26) and preferably crossing a corresponding step (32).

8. The feeding method according to claim 7, wherein the step of inserting the collar (9) into the pocket (24) comprises causing the collar (9) to come into contact by the head with the step (31) of the pocket (24).
9. The feeding method according to claim 7 or 8, where-

in the group (6) of smoking articles is axially inserted into the pocket (24) through the first opening (25) moving more on the inside of the step (31).

10. The feeding method according to claim 7, 8 or 9 and comprising the further step of:

folding in a "U"-shape, preferably after the insertion of the collar (9) and/or of the group (6) of smoking articles into the pocket (24), a wrapping sheet (13) around the drawer (20), so that the "U"-folded wrapping sheet (13) closes the second opening (26) of the pocket (24) and leaves the first opening (25) of the pocket (24) free; and inserting the group (6) of smoking articles and the collar (9) into the "U"-folded wrapping sheet (13) when the group (6) of smoking articles and the collar (9) are extracted from the drawer (20) together through the second opening (26).

11. A packing machine (14) for smoking articles comprising:

at least one drawer (20), which is, for example, made according to one of the claims from 1 to 6 and comprises a pocket (24), which has a tubular shape and is adapted to house a group (6) of smoking articles and a collar (9);

a wrapping conveyor (19), which supports the drawer (20) and feeds the drawer (20) along a wrapping path (P1);

a first feeding station (S1), in which the collar (9) is axially inserted into the pocket (24);

a second feeding station (S2), in which the group (6) of smoking articles is axially inserted into the pocket (24) through a first opening (25); and

a transfer station (S4) arranged downstream of the first feeding station (S1) and the second feeding station (S2) along the wrapping path (P1) and wherein the group (6) of smoking articles and the collar (9) are extracted from the drawer (20) together through a second opening (26) opposite to the first opening (25);

wherein at least one wall of the pocket (24) has a step (31), which is arranged close to the first opening (25), locally reducing the size of the pocket (24), and has a thickness equal to at least the corresponding thickness of the collar (9); and wherein in the first feeding station (S1), the collar (9) is arranged so as to face the step (31) of the pocket (24) headfirst;

the packing machine (14) is **characterized in that:**

in the first feeding station (S1), the collar (9) is inserted into the drawer (20) through the second opening (26); and it is provided an opposing element (34),

which is arranged in the second feeding station (S2), preferably in a fixed position, and comes into contact with the second opening (26) of the pocket (24) when the group (6) of smoking articles is inserted into the pocket (24) through the first opening (25), and wherein the group (6) of smoking articles and the collar (9) are extracted from the drawer (20) together by means of a pusher (36) provided with at least one projecting appendage, which is inserted into a groove (35) of the pocket (24) extending from the first opening (25) to the second opening (26) and preferably crossing a corresponding step (32).

12. The packing machine (14) according to claim 11, wherein, in the second feeding station (S2), the group (6) of smoking articles is inserted into the pocket (24) through the first opening (25) moving more on the inside of the step (31).

13. The packing machine (14) according to claim 11 or 12, wherein:

a third feeding station (S3) is provided, which is arranged downstream of the first feeding station (S1) and the second feeding station (S2) along the wrapping path (P1) and where a wrapping sheet (13) is folded in a "U"-shape around the drawer (20), so that the "U"-folded wrapping sheet (13) closes the second opening (26) of the pocket (24) and leaves the first opening (25) of the pocket (24) free; and

in the transfer station (S4) the group (6) of smoking articles and the collar (9) are inserted into the "U"-folded wrapping sheet (13) when the group (6) of smoking articles and the collar (9) are extracted from the drawer (20) together through the second opening (26).

Patentansprüche

1. Lade (20), die dafür ausgelegt ist, eine Gruppe (6) von Rauchartikeln und einen Kragen (9) zu beinhalten; wobei die Lade (20) ein Fach (24) umfasst, das eine Röhrenform aufweist, das dafür ausgelegt ist, die Gruppe (6) von Rauchartikeln und den Kragen (9) aufzunehmen, und eine erste Öffnung (25), durch die die Gruppe (6) von Rauchartikeln axial eingeführt werden kann, und eine zweite Öffnung (26) gegenüber der ersten Öffnung (25), durch die die Gruppe (6) von Rauchartikeln und der Kragen (9) aus der Lade (20) axial und gemeinsam herausgezogen werden können, aufweist;

wobei mindestens eine erste Wand (27) des

- Fachs (24) eine erste Stufe (31) aufweist, die nahe der ersten Öffnung (25) angeordnet ist, die Größe des Fachs (24) lokal verringert und eine Dicke aufweist, die zumindest gleich der entsprechenden Dicke des Kragens (9) ist; wobei die Lade (20) **dadurch gekennzeichnet ist, dass** das Fach (24) mindestens eine Nut (35) aufweist, die sich von der ersten Öffnung (25) zu der zweiten Öffnung (26) und bevorzugt durch eine entsprechende Stufe (32) erstreckt.
2. Lade (20) nach Anspruch 1, wobei die Stufe (31) eine Dicke aufweist, die von 0,5 bis 0,8 mm reicht.
 3. Lade (20) nach Anspruch 1 oder 2, wobei zwei zweite Wände (28) des Fachs (24), die an gegenüberliegenden Seiten der ersten Wand (27) des Fachs (24) angeordnet sind, zwei zweite Stufen (32) aufweisen, die jeweils nahe der ersten Öffnung (25) angeordnet sind, die Größe des Fachs (24) lokal verringern, und eine Dicke aufweisen, die zumindest gleich der entsprechenden Dicke des Kragens (9) ist.
 4. Lade (20) nach Anspruch 1, 2 oder 3, wobei die Stufe (31) in dem Fach (24) eine Innenwand aufweist, die von der ersten Wand (27) des Fachs (24) vorsteht, flach ist und einen spitzen Winkel mit der ersten Wand (27) des Fachs (24) bildet.
 5. Lade (20) nach Anspruch 1, 2 oder 3, wobei die Stufe (31) in dem Fach (24) eine Innenwand aufweist, die von der ersten Wand (27) des Fachs (24) vorsteht und eine Nut aufweist, die eine Dicke aufweist, die zumindest gleich der entsprechenden Dicke des Kragens (9) ist.
 6. Lade (20) nach einem der Ansprüche von 1 bis 5, wobei die erste Wand (27) des Fachs (24), die mit der ersten Stufe (31) versehen ist, eine untere Wand ist, auf der der Kragen (9) aufliegt.
 7. Verfahren zum Zuführen einer Gruppe (6) von Rauchartikeln und eines Kragens (9) zu einer Lade (20), die beispielsweise gemäß einem der Ansprüche von 1 bis 6 ausgebildet ist und ein Fach (24) umfasst, das eine Röhrenform hat und dafür ausgelegt ist, die Gruppe (6) von Rauchartikeln und den Kragen (9) aufzunehmen; wobei das Zuführverfahren die Schritte umfasst:
 - axiales Einführen des Kragens (9) in das Fach (24);
 - axiales Einführen der Gruppe (6) von Rauchartikeln in das Fach (24) durch eine erste Öffnung (25); und
 - axiales und gemeinsames Herausziehen der Gruppe (6) von Rauchartikeln und des Kragens (9) aus der Lade (20) durch eine zweite Öffnung (26) gegenüber der ersten Öffnung (25); wobei mindestens eine Wand des Fachs (24) eine Stufe (31) aufweist, die nahe der ersten Öffnung (25) angeordnet ist, die Größe des Fachs (24) lokal verringert, und eine Dicke aufweist, die zumindest gleich der entsprechenden Dicke des Kragens (9) ist; und wobei der Schritt des Einführens des Kragens (9) in das Fach (24) das Bewirken, dass der Kragen (9) der Stufe (31) des Fachs (24) mit dem Kopf voran zugewandt ist, umfasst; wobei das Zuführverfahren **dadurch gekennzeichnet ist, dass** es die weiteren Schritte umfasst:
 - axiales Einführen des Kragens (9) in das Fach (24) als erstes durch die zweite Öffnung (26); und
 - Anlegen eines Gegelements (34) gegen die zweite Öffnung (26) des Fachs (24), wenn die Gruppe (6) von Rauchartikeln durch die erste Öffnung (25) in das Fach (24) eingeführt wird, und wobei die Gruppe (6) von Rauchartikeln und der Kragen (9) gemeinsam mittels eines Schiebers (36), der mit mindestens einem vorstehenden Fortsatz versehen ist, der in eine Nut (35) des Fachs (24) eingeführt wird, die sich von der ersten Öffnung (25) bis zur zweiten Öffnung (26) erstreckt und bevorzugt eine entsprechende Stufe (32) kreuzt, aus der Lade (20) herausgezogen werden.
 8. Zuführverfahren nach Anspruch 7, wobei der Schritt des Einführens des Kragens (9) in das Fach (24) das Bewirken, dass der Kragen (9) mit dem Kopf mit der Stufe (31) des Fachs (24) in Kontakt kommt, umfasst.
 9. Zuführverfahren nach Anspruch 7 oder 8, wobei die Gruppe (6) von Rauchartikeln durch die erste Öffnung (25) in das Fach (24) axial eingeführt wird und sich mehr auf der Innenseite der Stufe (31) bewegt.
 10. Zuführverfahren nach Anspruch 7, 8 oder 9, und umfassend den weiteren Schritt:
 - Falten eines Umhüllungsbogens (13), bevorzugt nach dem Einführen des Kragens (9) und/oder der Gruppe (6) von Rauchartikeln in das Fach (24), in einer "U"-Form um die Lade (20), so dass der "U"-förmig gefaltete Umhüllungsbogen (13) die zweite Öffnung (26) des Fachs (24) verschließt und die erste Öffnung (25) des Fachs (24) frei lässt; und
 - Einführen der Gruppe (6) von Rauchartikeln und des Kragens (9) in den "U"-förmig gefalteten Umhüllungsbogen (13), wenn die Gruppe (6)

von Rauchartikeln und der Kragen (9) gemeinsam durch die zweite Öffnung (26) aus der Lade (20) herausgezogen werden.

11. Verpackungsmaschine (14) für Rauchartikel, die umfasst:

mindestens eine Lade (20), die beispielsweise nach einem der Ansprüche von 1 bis 6 hergestellt ist und ein Fach (24) umfasst, das röhrenförmig ist und dafür ausgelegt ist, eine Gruppe (6) von Rauchartikeln und einen Kragen (9) aufzunehmen;

einen Umhüllungsförderer (19), der die Lade (20) trägt und die Lade (20) entlang eines Umhüllungswegs (P1) zuführt;

eine erste Zuführstation (S1), in der der Kragen (9) axial in das Fach (24) eingeführt wird;

eine zweite Zuführstation (S2), in der die Gruppe (6) von Rauchartikeln durch eine erste Öffnung (25) axial in das Fach (24) eingeführt wird; und eine Übergabestation (S4), die hinter der ersten Zuführstation (S1) und der zweiten Zuführstation (S2) entlang des Umhüllungswegs (P1) angeordnet ist, und wobei die Gruppe (6) von Rauchartikeln und der Kragen (9) durch eine zweite Öffnung (26) gegenüber der ersten Öffnung (25) gemeinsam aus der Lade (20) herausgezogen werden;

wobei mindestens eine Wand des Fachs (24) eine Stufe (31) aufweist, die nahe der ersten Öffnung (25) angeordnet ist, die Größe des Fachs (24) lokal verringert, und eine Dicke aufweist, die zumindest gleich der entsprechenden Dicke des Kragens (9) ist; und

wobei in der ersten Zuführstation (S1), der Kragen (9) derart angeordnet ist, dass er der Stufe (31) des Fachs (24) mit dem Kopf voran gegenüberliegt;

wobei die Verpackungsmaschine (14) **dadurch gekennzeichnet ist, dass:**

in der ersten Zuführstation (S1), der Kragen (9) durch die zweite Öffnung (26) in die Lade (20) eingeführt wird; und

ein Gegenelement (34) vorgesehen ist, das in der zweiten Zuführstation (S2) bevorzugt in einer festen Position angeordnet ist, und mit der zweiten Öffnung (26) des Fachs (24) in Kontakt kommt, wenn die Gruppe (6) von Rauchartikeln durch die erste Öffnung (25) in das Fach (24) eingeführt wird, und wobei die Gruppe (6) von Rauchartikeln und der Kragen (9) gemeinsam mittels eines Schiebers (36), der mit mindestens einem vorstehenden Fortsatz versehen ist, der in eine Nut (25) des Fachs (24) eingeführt wird, die sich von der ersten Öffnung (25) bis zu der

zweiten Öffnung (26) erstreckt und bevorzugt eine entsprechende Stufe (32) kreuzt, aus der Lade (20) herausgezogen werden.

12. Verpackungsmaschine (14) nach Anspruch 11, wobei in der zweiten Zuführstation (S2) die Gruppe (6) von Rauchartikeln durch die erste Öffnung (25) in das Fach (24) eingeführt wird und sich mehr auf der Innenseite der Stufe (31) bewegt.

13. Verpackungsmaschine (14) nach Anspruch 11 oder 12, wobei:

eine dritte Zuführstation (S3) vorgesehen ist, die stromabwärts der ersten Zuführstation (S1) und der zweiten Zuführstation (S2) entlang des Umhüllungswegs (P1) angeordnet ist, und wo ein Umhüllungsbogen (13) in einer "U"-Form um die Lade (20) gefaltet wird, so dass der "U"-förmig gefaltete Umhüllungsbogen (13) die zweite Öffnung (26) des Fachs (24) verschließt und die erste Öffnung (25) des Fachs (24) frei lässt; und in der Übergabestation (S4) die Gruppe (6) von Rauchartikeln und der Kragen (9) in den "U"-förmig gefalteten Umhüllungsbogen (13) eingeführt werden, wenn die Gruppe (6) von Rauchartikeln und der Kragen (9) gemeinsam durch die zweite Öffnung (26) aus der Lade (20) herausgezogen werden.

Revendications

1. Tiroir (20) adapté pour contenir un groupe (6) d'articles à fumer et un collier (9) ; le tiroir (20) comprend une poche (24) qui a une forme tubulaire, est adaptée pour loger le groupe (6) d'articles à fumer et le collier (9) et a une première ouverture (25), à travers laquelle le groupe (6) d'articles à fumer peut être axialement inséré, et une seconde ouverture (26) opposée à la première ouverture (25) par laquelle le groupe (6) d'articles à fumer et le collier (9) peuvent être extraits du tiroir (20) axialement et ensemble ;

dans lequel au moins une première paroi (27) de la poche (24) a un premier gradin (31) qui est agencé à proximité de la première ouverture (25), réduit localement la taille de la poche (24) et a une épaisseur égale au moins à l'épaisseur correspondante du collier (9) ;

le tiroir (20) est **caractérisé en ce que** la poche (24) a au moins une rainure (35), qui s'étend à partir de la première ouverture (25) jusqu'à la seconde ouverture (26) et de préférence par un gradin (32) correspondant.

2. Tiroir (20) selon la revendication 1, dans lequel le gradin (31) a une épaisseur allant de 0,5 à 0,8 mm.

3. Tiroir (20) selon la revendication 1 ou 2, dans lequel deux secondes parois (28) de la poche (24) agencée sur les côtés opposés de la première paroi (27) de la poche (24) ont deux seconds gradins (32), chacun agencé à proximité de la première ouverture (25), réduisant localement la taille de la poche (24) et ayant une épaisseur égale au moins à l'épaisseur correspondante du collier (9).
4. Tiroir (20) selon la revendication 1, 2 ou 3, dans lequel le gradin (31) a, à l'intérieur de la poche (24), une paroi interne qui fait saillie de la première paroi (27) de la poche (24), est plate et forme un angle aigu avec la première paroi (27) de la poche (24).
5. Tiroir (20) selon la revendication 1, 2 ou 3, dans lequel le gradin (31) a, à l'intérieur de la poche (24), une paroi interne qui fait saillie de la première paroi (27) de la poche (24) et a une rainure ayant une épaisseur égale au moins à l'épaisseur correspondante du collier (9).
6. Tiroir (20) selon l'une des revendications 1 à 5, dans lequel la première paroi (27) de la poche (24), prévue avec le premier gradin (31), est une paroi inférieure sur laquelle le collier (9) s'appuie.
7. Procédé pour amener un groupe (6) d'articles à fumer et un collier (9) à un tiroir (20), qui est réalisé par exemple selon l'une des revendications 1 à 6, et comprend une poche (24) qui a une forme tubulaire et est adaptée pour loger le groupe (6) d'articles à fumer et le collier (9) ; le procédé d'alimentation comprend les étapes suivantes :
- insérer axialement le collier (9) dans la poche (24) ;
insérer axialement le groupe (6) d'articles à fumer dans la poche (24) par une première ouverture (25) ; et
extraire le groupe (6) d'articles à fumer et le collier (9) du tiroir (20) axialement et ensemble par une seconde ouverture (26) opposée à la première ouverture (25) ;
au moins une paroi de la poche (24) a un gradin (31) qui est agencé à proximité de la première ouverture (25), réduisant localement la taille de la poche (24) et a une épaisseur égale au moins à l'épaisseur correspondante du collier (9) ; et l'étape pour insérer le collier (9) dans la poche (24) comprend l'étape pour amener le collier (9) à faire face au gradin (31) de la poche (24) tête la première ;
le procédé d'alimentation est **caractérisé en ce qu'il** comprend les étapes supplémentaires suivantes :
- insérer axialement le collier (9) dans la poche (24) tout d'abord par la seconde ouverture (26) ; et appuyer un élément opposé (34) contre la seconde ouverture (26) de la poche (24) lorsque le groupe (6) d'articles à fumer est inséré dans la poche (24) par la première ouverture (25), et dans lequel le groupe (6) d'articles à fumer et le collier (9) sont extraits du tiroir (20) ensemble au moyen d'un poussoir (36) prévu avec au moins un appendice en saillie, qui est inséré dans une rainure (35) de la poche (24) s'étendant à partir de la première ouverture (25) jusqu'à la seconde ouverture (26) et traversant de préférence un gradin (32) correspondant.
8. Procédé d'alimentation selon la revendication 7, dans lequel l'étape pour insérer le collier (9) dans la poche (24) comprend l'étape pour amener le collier (9) à venir en contact, par la tête, avec le gradin (31) de la poche (24).
9. Procédé d'alimentation selon la revendication 7 ou 8, dans lequel le groupe (6) d'articles à fumer est axialement inséré dans la poche (24) par la première ouverture (25) en se déplaçant plus à l'intérieur du gradin (31).
10. Procédé d'alimentation selon la revendication 7, 8 ou 9 et comprenant l'étape supplémentaire suivante :
- plier, en forme de « U », de préférence après l'insertion du collier (9) et/ou du groupe (6) d'articles à fumer dans la poche (24), une feuille d'emballage (13) autour du tiroir (20), de sorte que la feuille d'emballage (13) pliée en « U » ferme la seconde ouverture (26) de la poche (24) et laisse la première ouverture (25) de la poche (24) libre ; et
insérer le groupe (6) d'articles à fumer et le collier (9) dans la feuille d'emballage (13) pliée en « U » lorsque le groupe (6) d'articles à fumer et le collier (9) sont extraits du tiroir (20) ensemble par la seconde ouverture (26).
11. Machine d'emballage (14) pour articles à fumer comprenant : au moins un tiroir (20) qui est, par exemple, réalisé selon l'une des revendications 1 à 6 et comprend une poche (24) qui a une forme tubulaire et est adaptée pour loger un groupe (6) d'articles à fumer et un collier (9) ;
un transporteur d'emballage (19) qui supporte le tiroir (20) et amène le tiroir (20) le long d'une trajectoire d'emballage (P1) ;
une première station d'alimentation (S1), dans laquelle le collier (9) est axialement inséré dans

la poche (24) ;
 une deuxième station d'alimentation (S2), dans laquelle le groupe (6) d'articles à fumer est axialement inséré dans la poche (24) par une première ouverture (25) ; et
 une station de transfert (S4) agencée en aval de la première station d'alimentation (S1) et de la deuxième station d'alimentation (S2) le long de la trajectoire d'emballage (P1) et dans laquelle le groupe (6) d'articles à fumer et le collier (9) sont extraits du tiroir (20) ensemble par une seconde ouverture (26) opposée à la première ouverture (25) ;
 dans laquelle au moins une paroi de la poche (24) a un gradin (31) qui est agencé à proximité de la première ouverture (25), réduisant localement la taille de la poche (24) et a une épaisseur égale au moins à l'épaisseur correspondante du collier (9) ; et dans laquelle dans la première station d'alimentation (S1), le collier (9) est agencé pour faire face au gradin (31) de la poche (24) la tête la première ;
 la machine d'emballage (14) est **caractérisée en ce que** :

dans la première station d'emballage (S1), le collier (9) est inséré dans le tiroir (20) par la seconde ouverture (26) ; et
 on prévoit un élément opposé (34) qui est agencé dans la deuxième station d'alimentation (S2), de préférence dans une position fixe, et vient en contact avec la seconde ouverture (26) de la poche (24) lorsque le groupe (6) d'articles à fumer est inséré dans la poche (24) par la première ouverture (25), et dans laquelle le groupe (6) d'articles à fumer et le collier (9) sont extraits du tiroir (20) ensemble au moyen d'un poussoir (36) prévu avec au moins un appendice en saillie, qui est inséré dans une rainure (35) de la poche (24) s'étendant à partir de la première ouverture (25) jusqu'à la seconde ouverture (26) et traversant de préférence un gradin (32) correspondant.

12. Machine d'emballage (14) selon la revendication 11, dans laquelle, dans la deuxième station d'alimentation (S2), le groupe (6) d'articles à fumer est inséré dans la poche (24) par la première ouverture (25), en se déplaçant plus à l'intérieur du gradin (31).

13. Machine d'emballage (14) selon la revendication 11 ou 12, dans laquelle :

on prévoit une troisième station d'alimentation (S3) qui est agencée en aval de la première station d'alimentation (S1) et de la deuxième station d'alimentation (S2) le long de la trajectoire d'em-

ballage (P1) et où une feuille d'emballage (13) est pliée en une forme de « U » autour du tiroir (20), de sorte que la feuille d'emballage (13) pliée en « U » ferme la seconde ouverture (26) de la poche (24) et laisse la première ouverture (25) de la poche (24) libre ; et
 dans la station de transfert (S4), le groupe (6) d'articles à fumer et le collier (9) sont insérés dans la feuille d'emballage (13) pliée en « U » lorsque le groupe (6) d'articles à fumer et le collier (9) sont extraits du tiroir (20) ensemble par la seconde ouverture (26) .

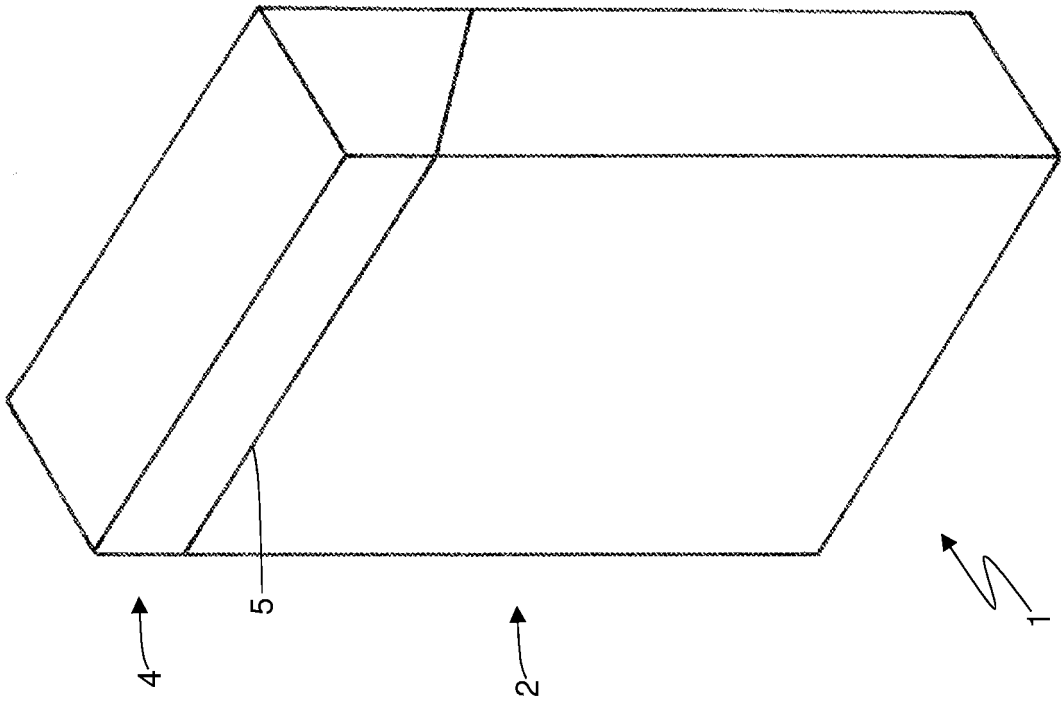


Fig. 2

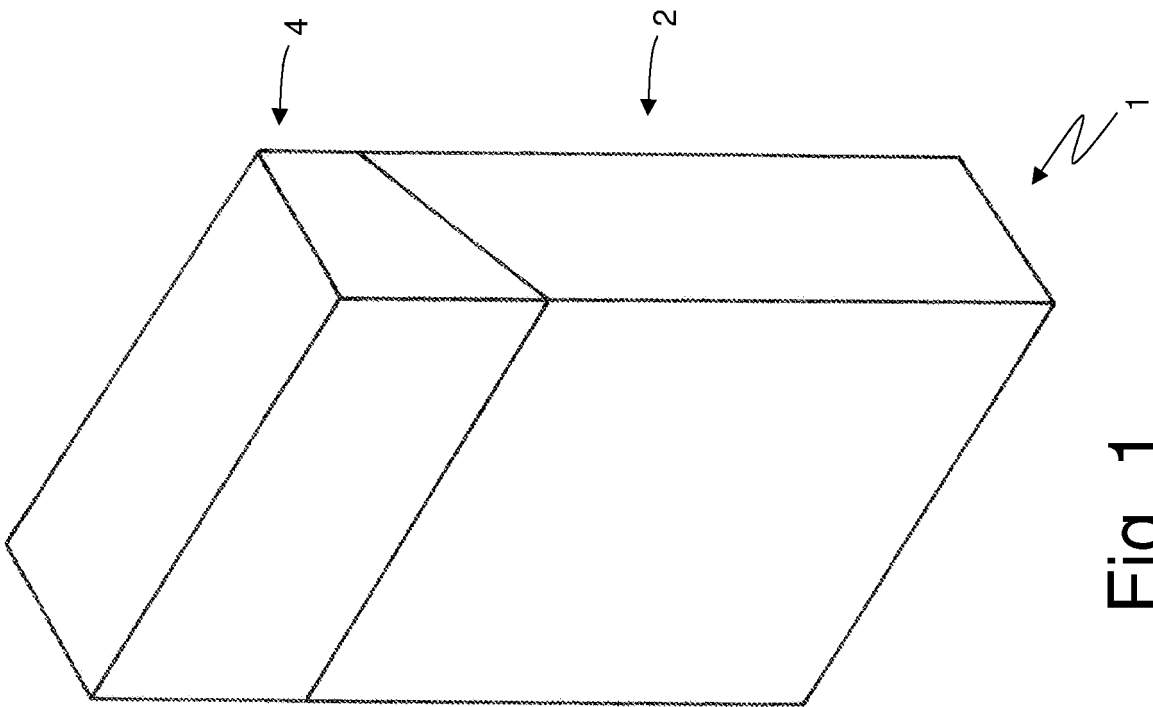


Fig. 1

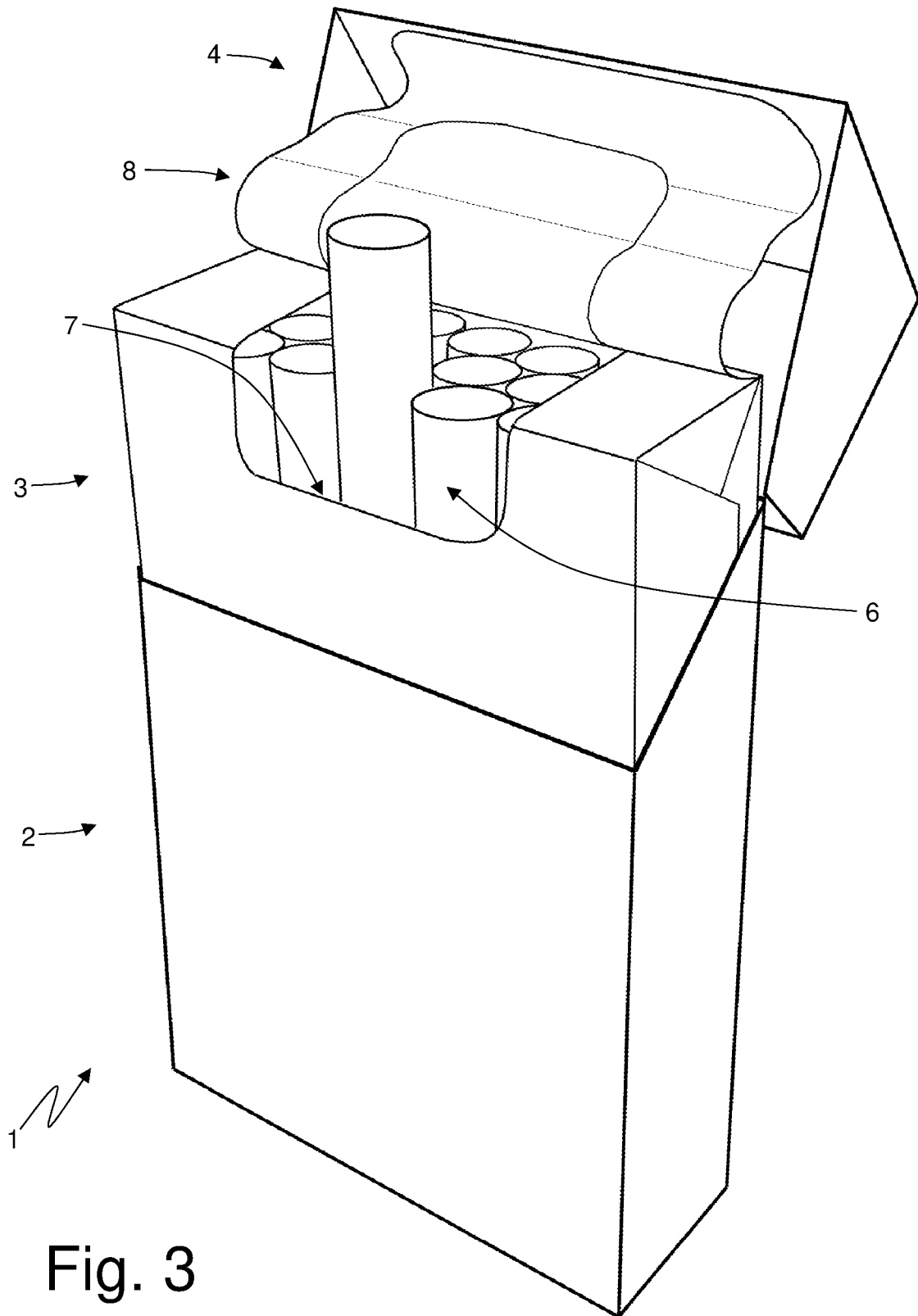


Fig. 3

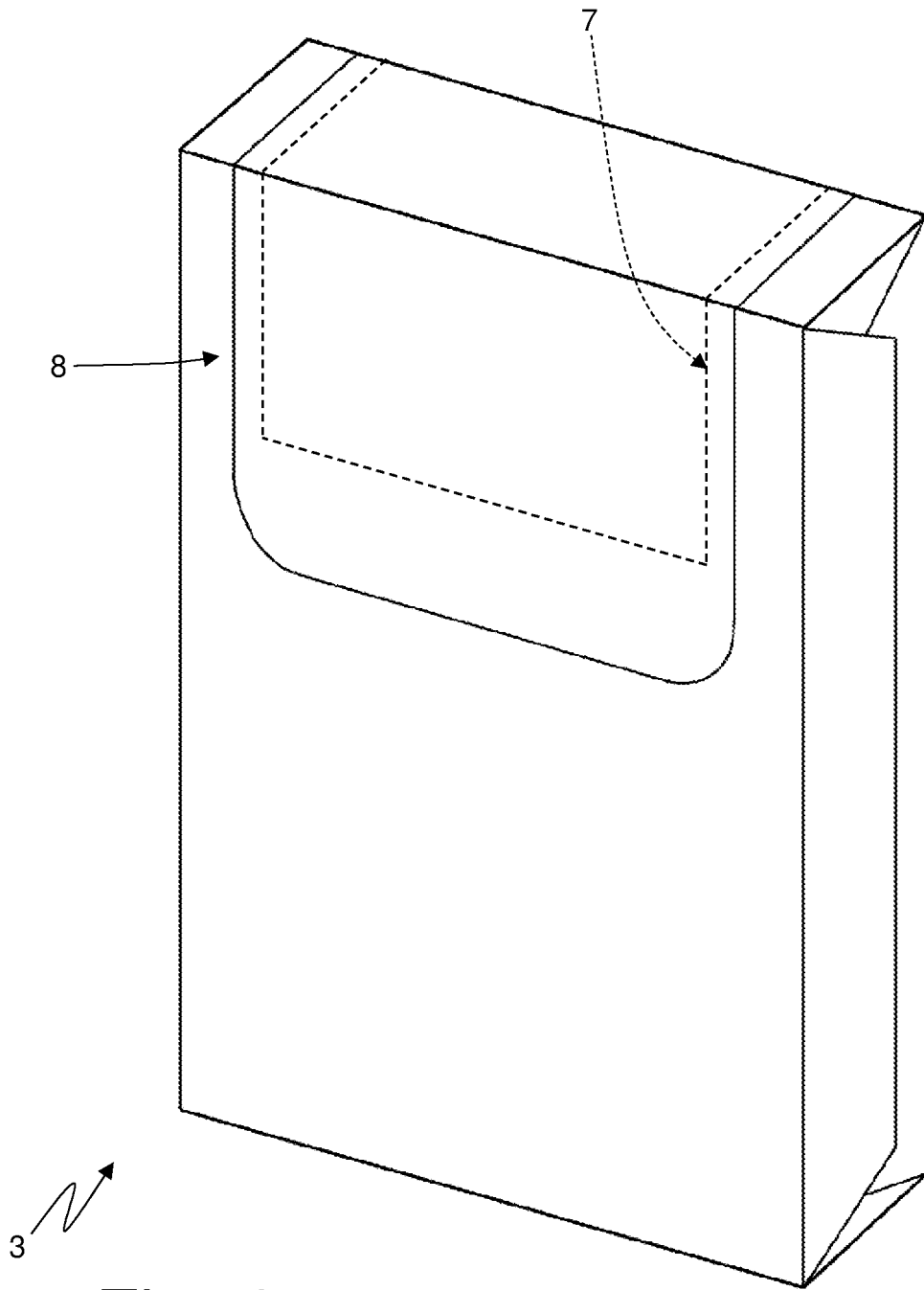


Fig. 4

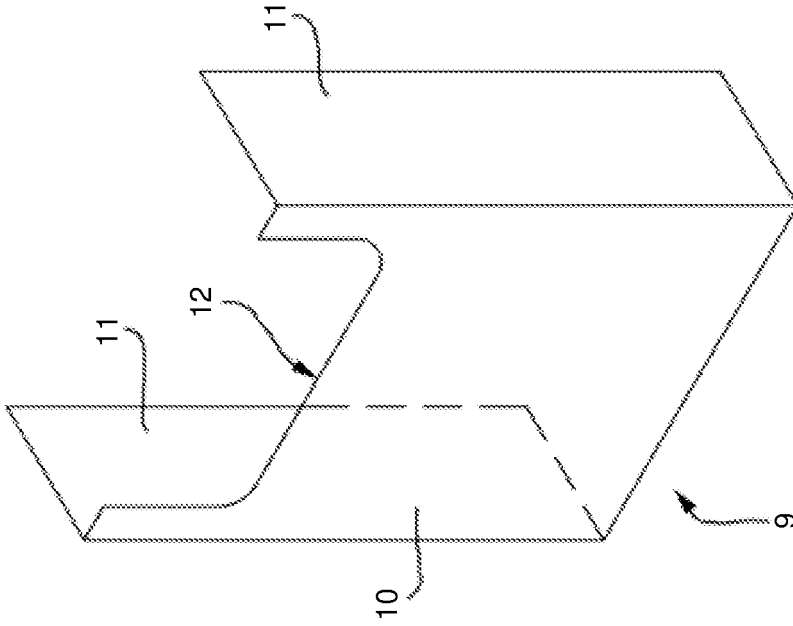


Fig. 6

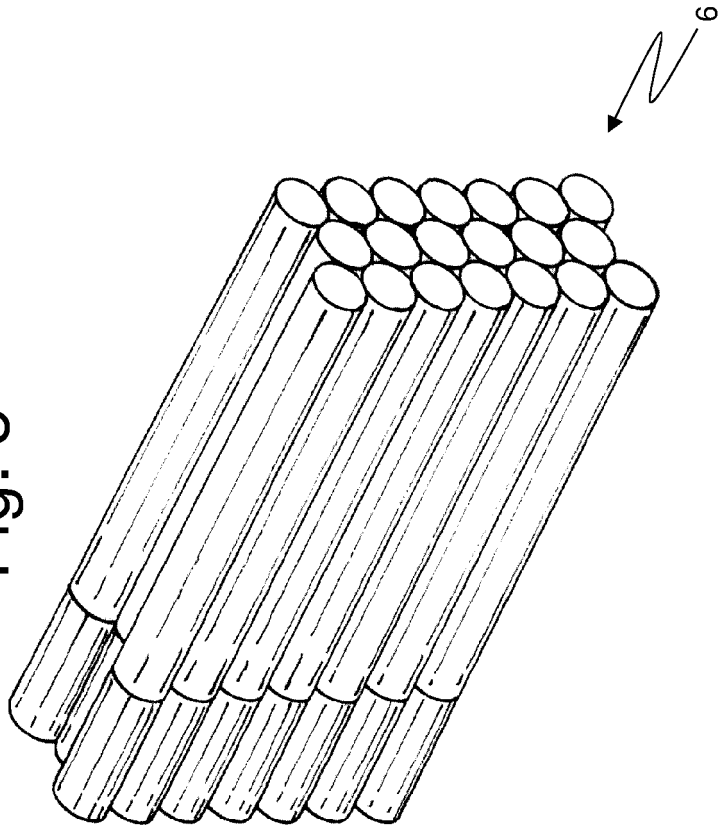


Fig. 5

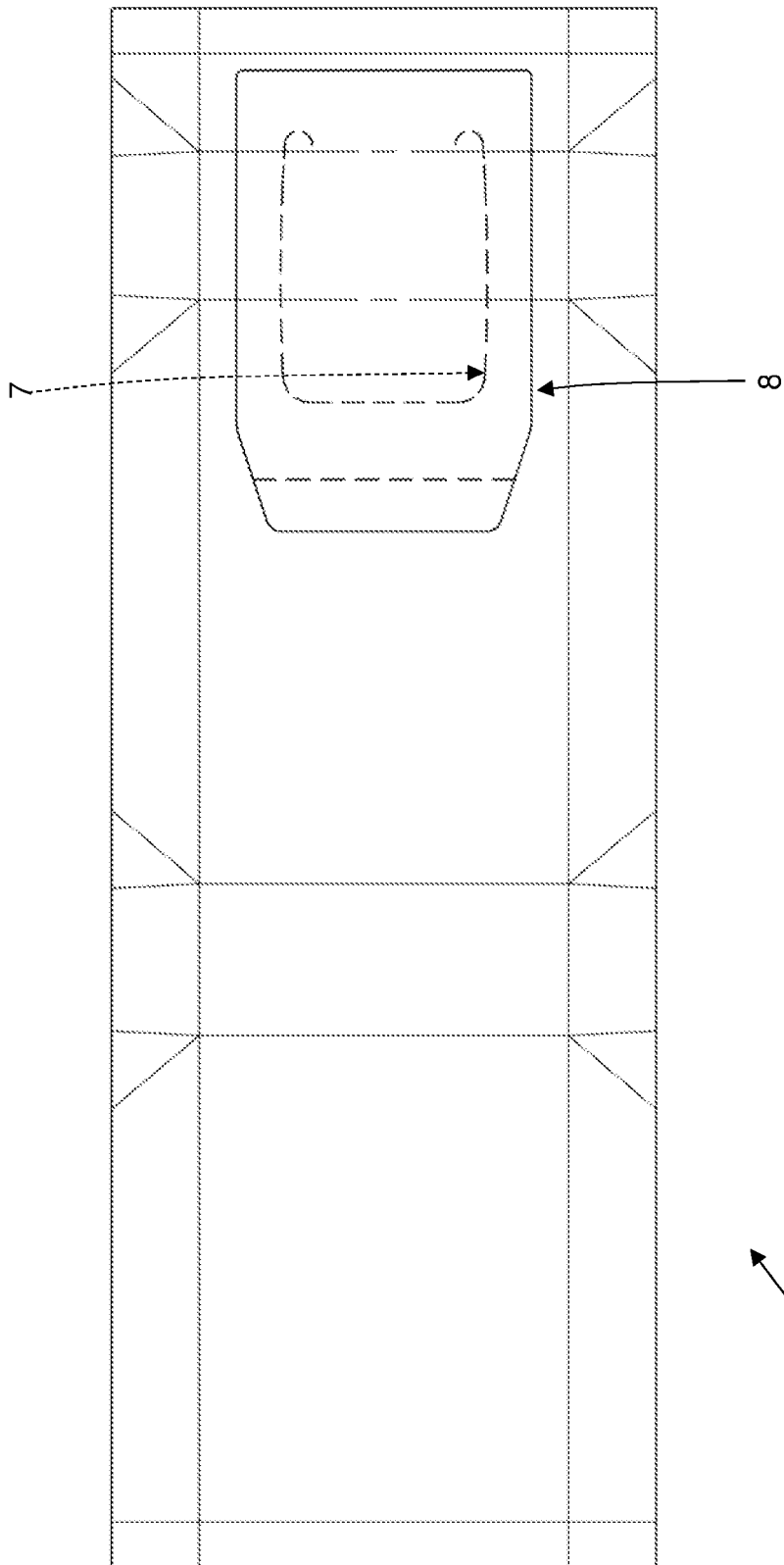


Fig. 7

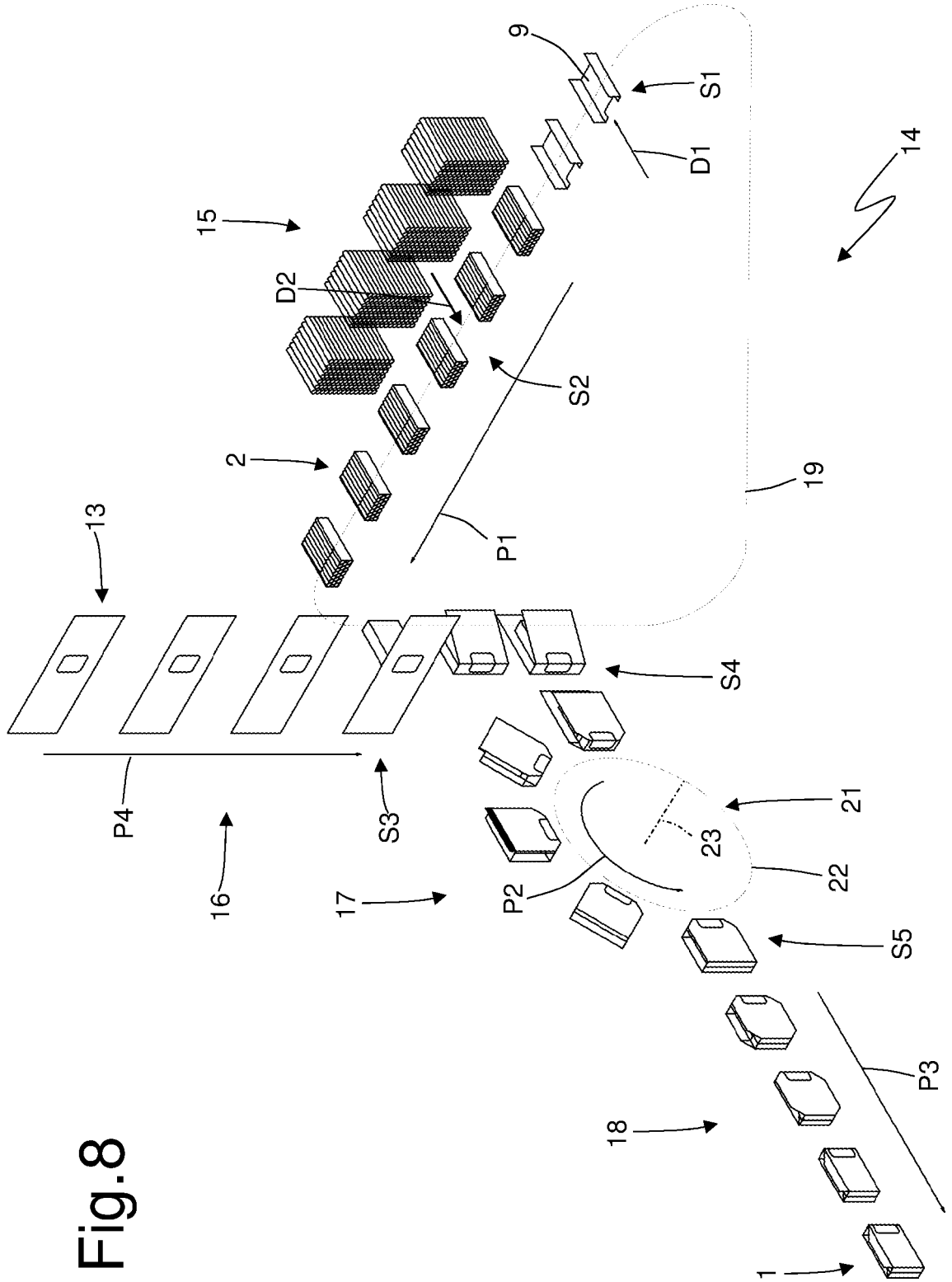


Fig. 8

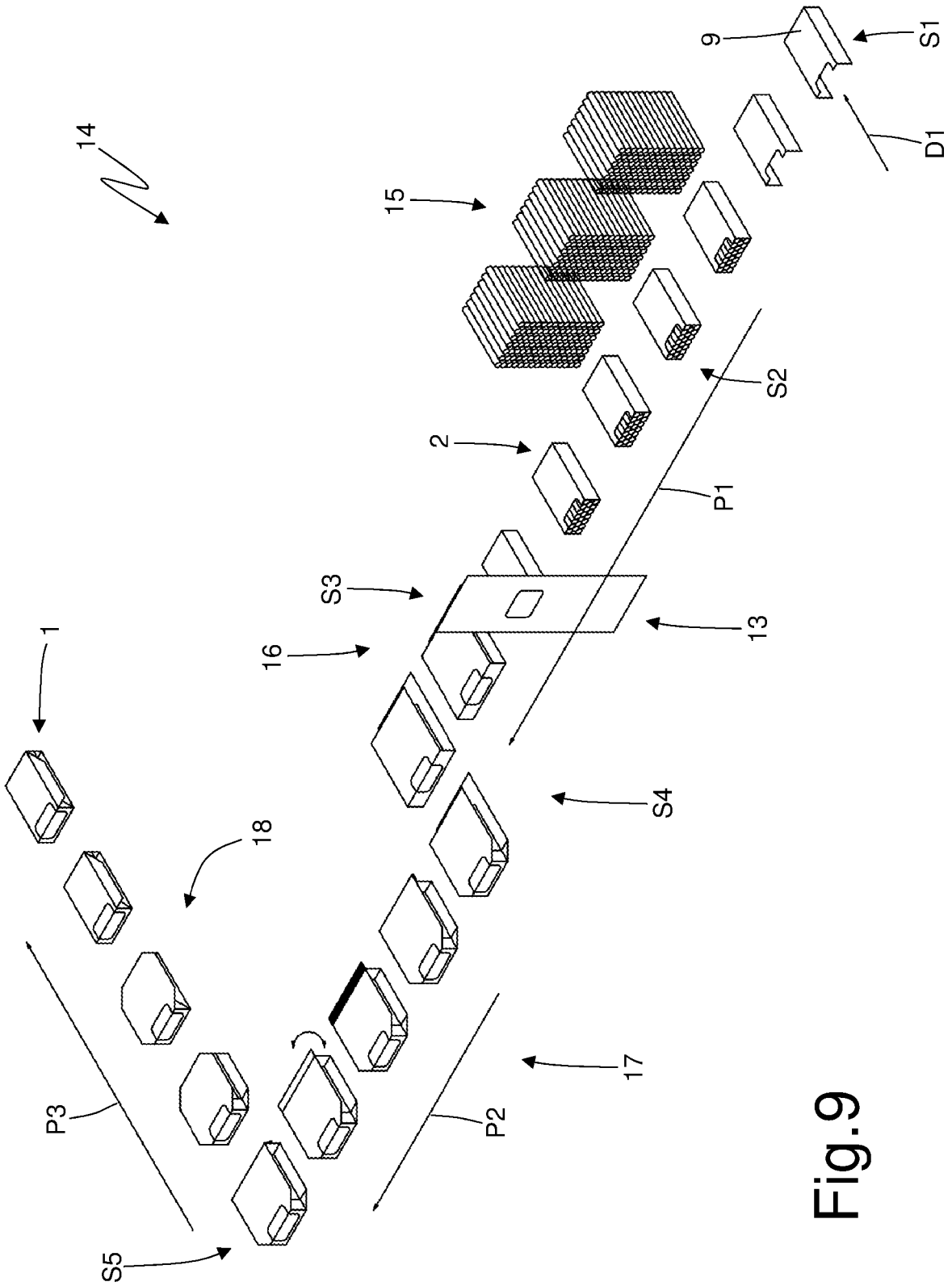


Fig.9

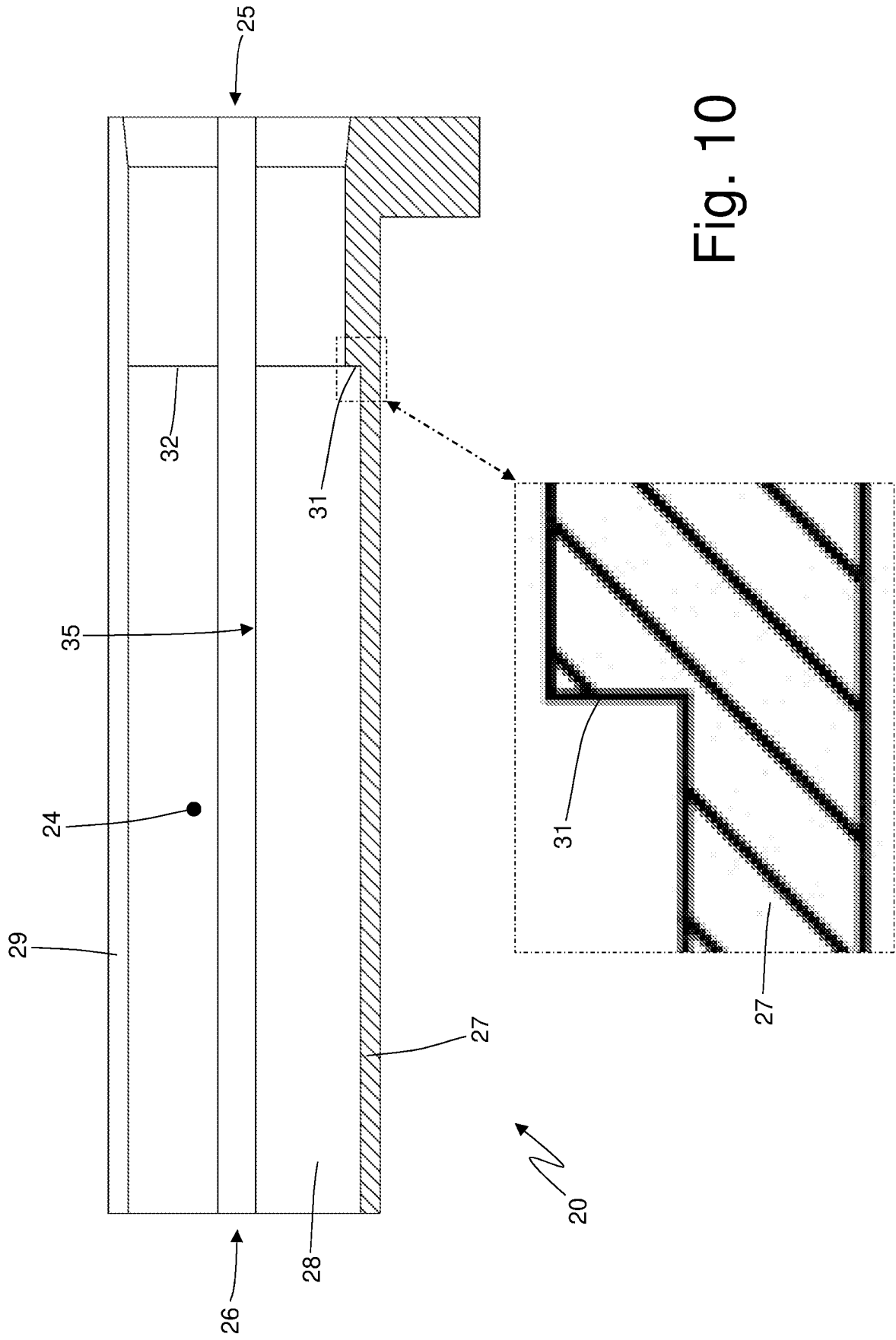


Fig. 10

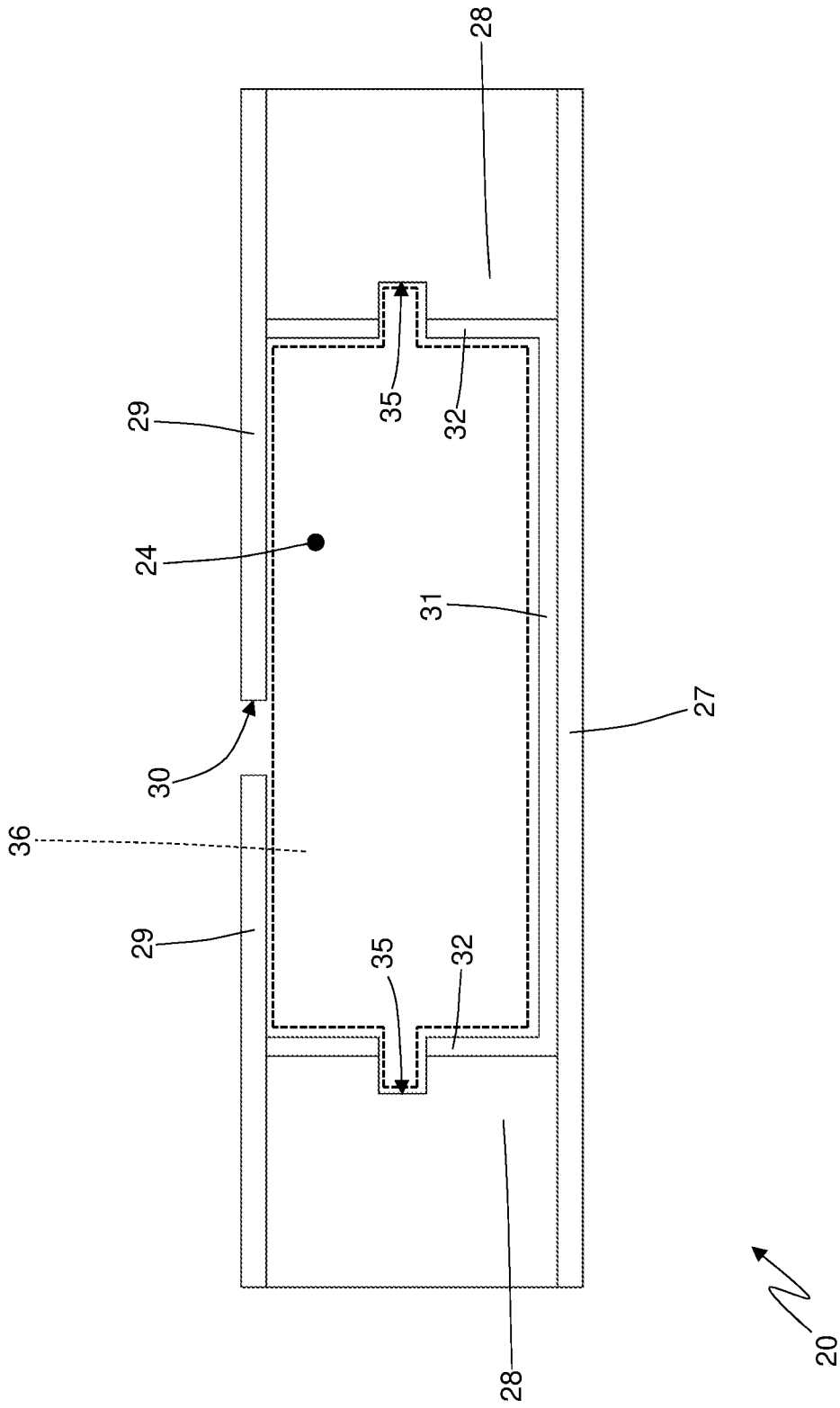


Fig. 11

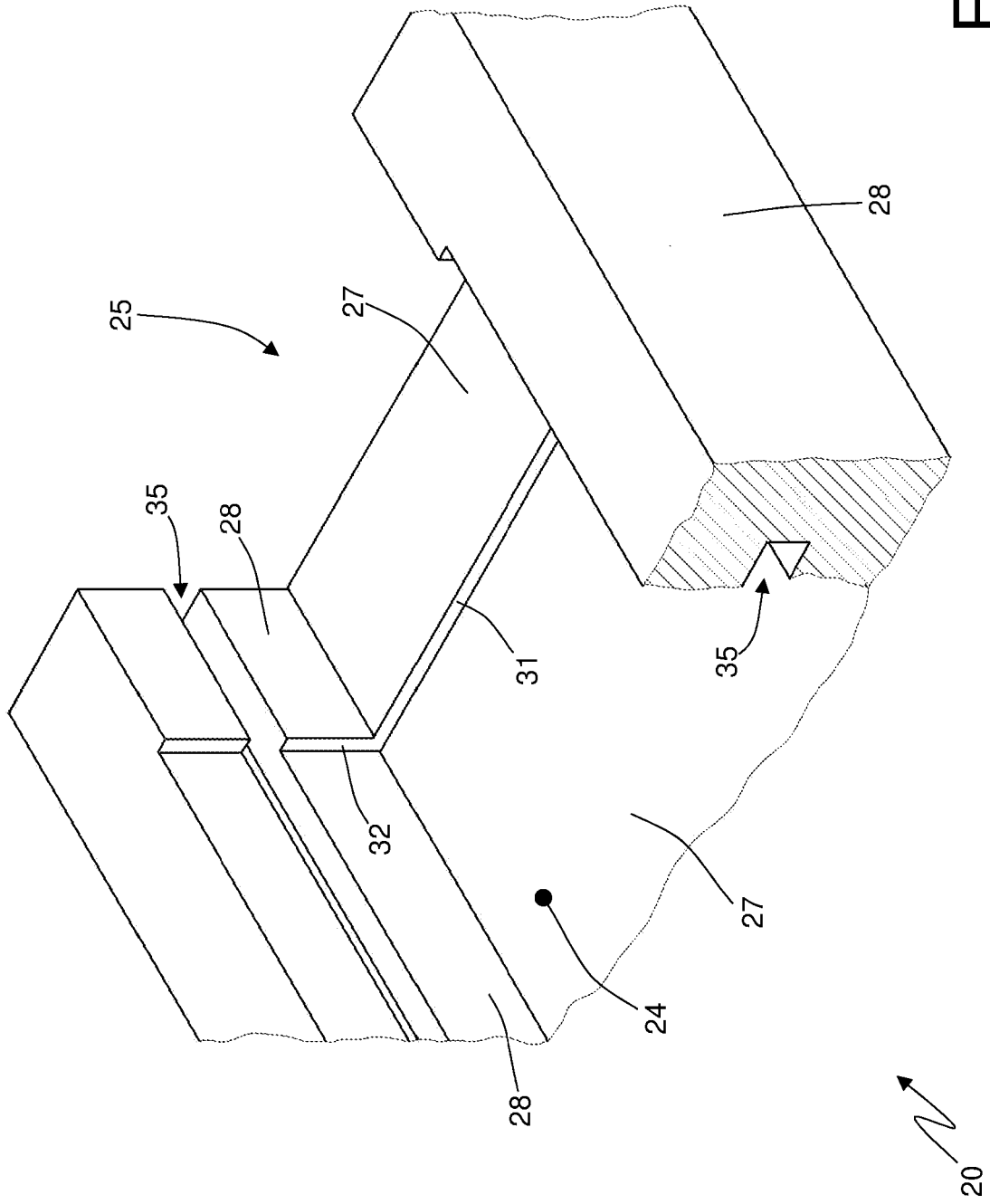


Fig. 12

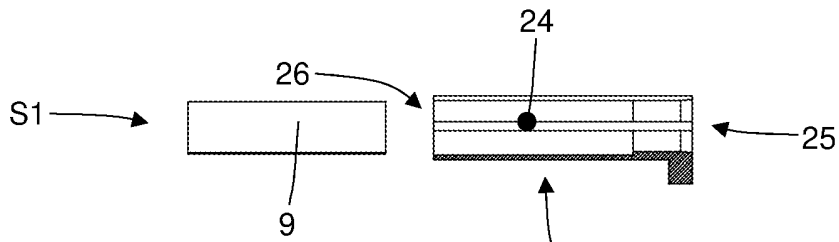


Fig. 13a

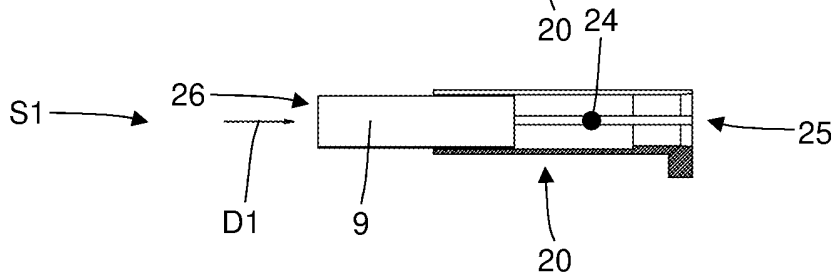


Fig. 13b

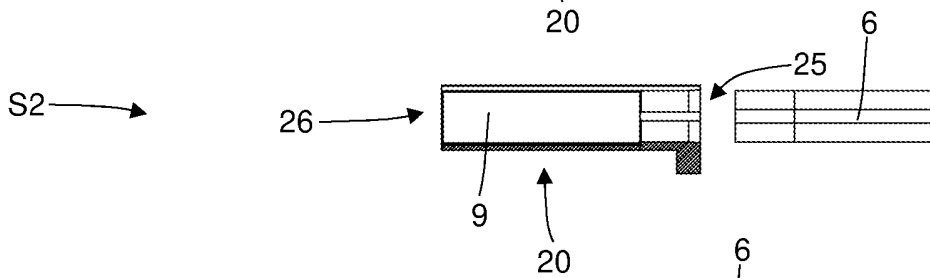


Fig. 13c

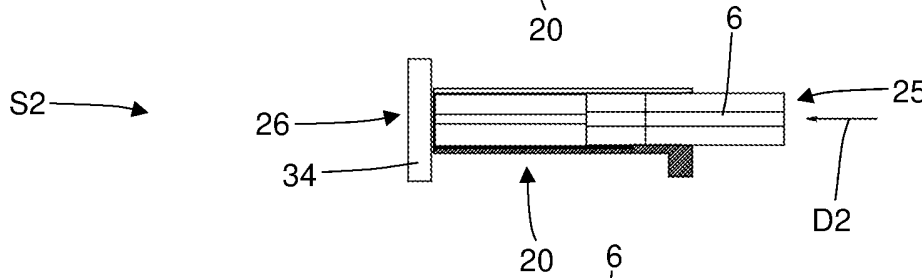


Fig. 13d

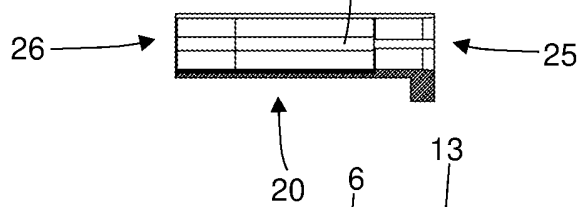


Fig. 13e

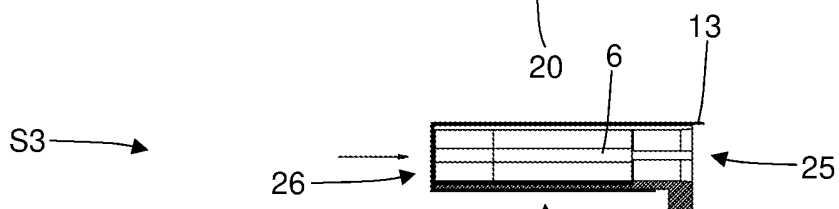


Fig. 13f

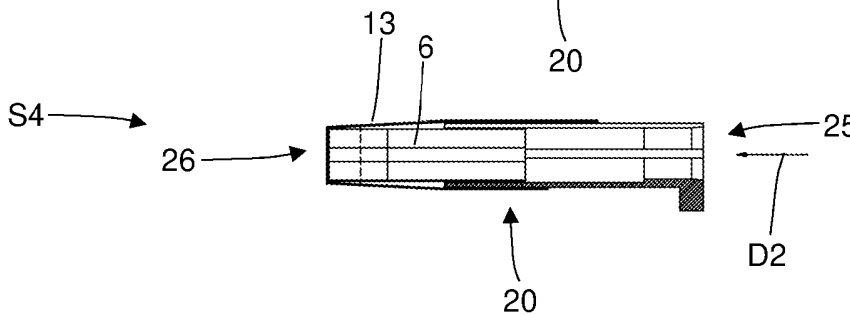


Fig. 13g

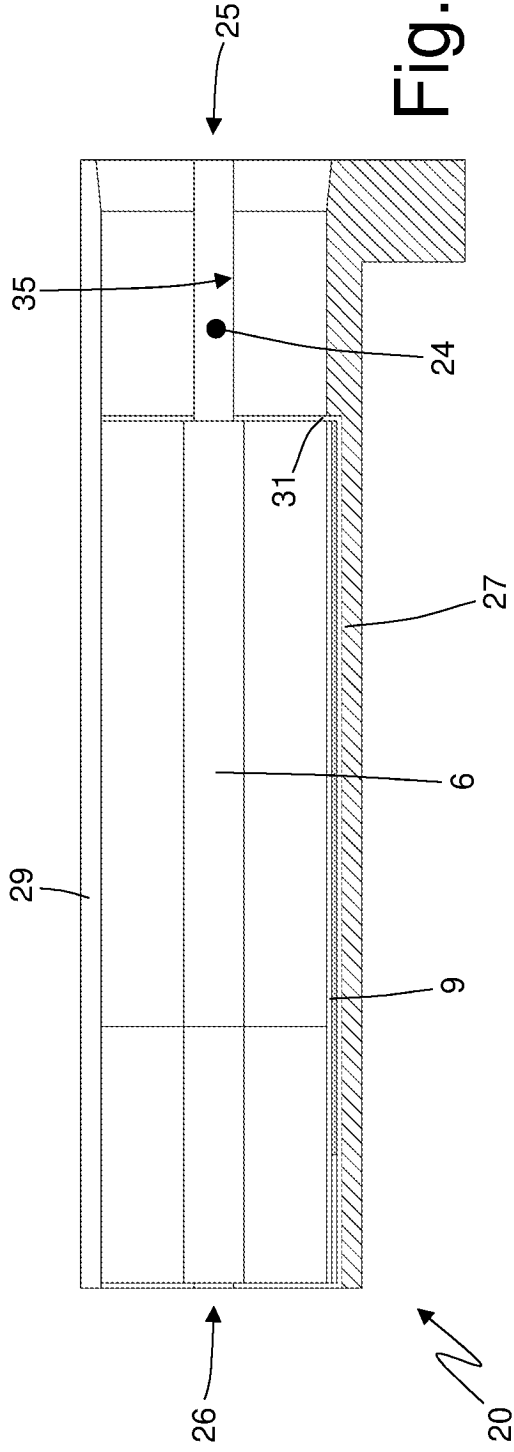


Fig. 14a

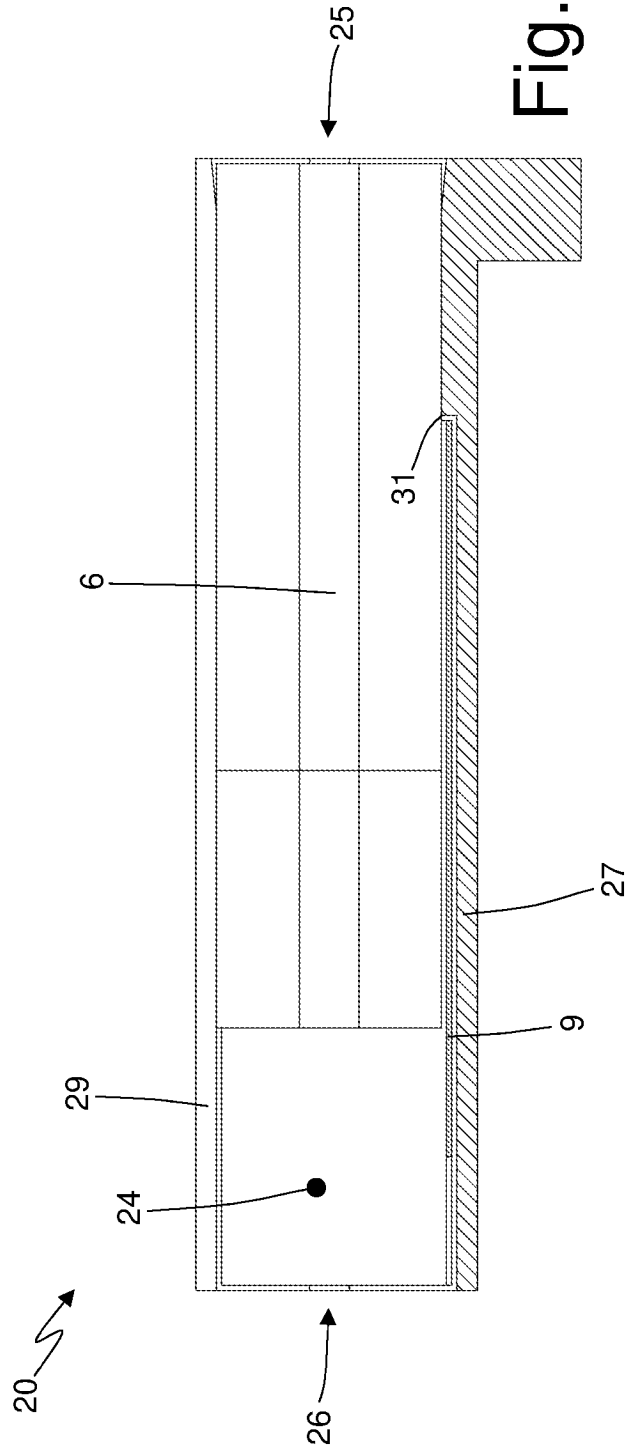


Fig. 14b

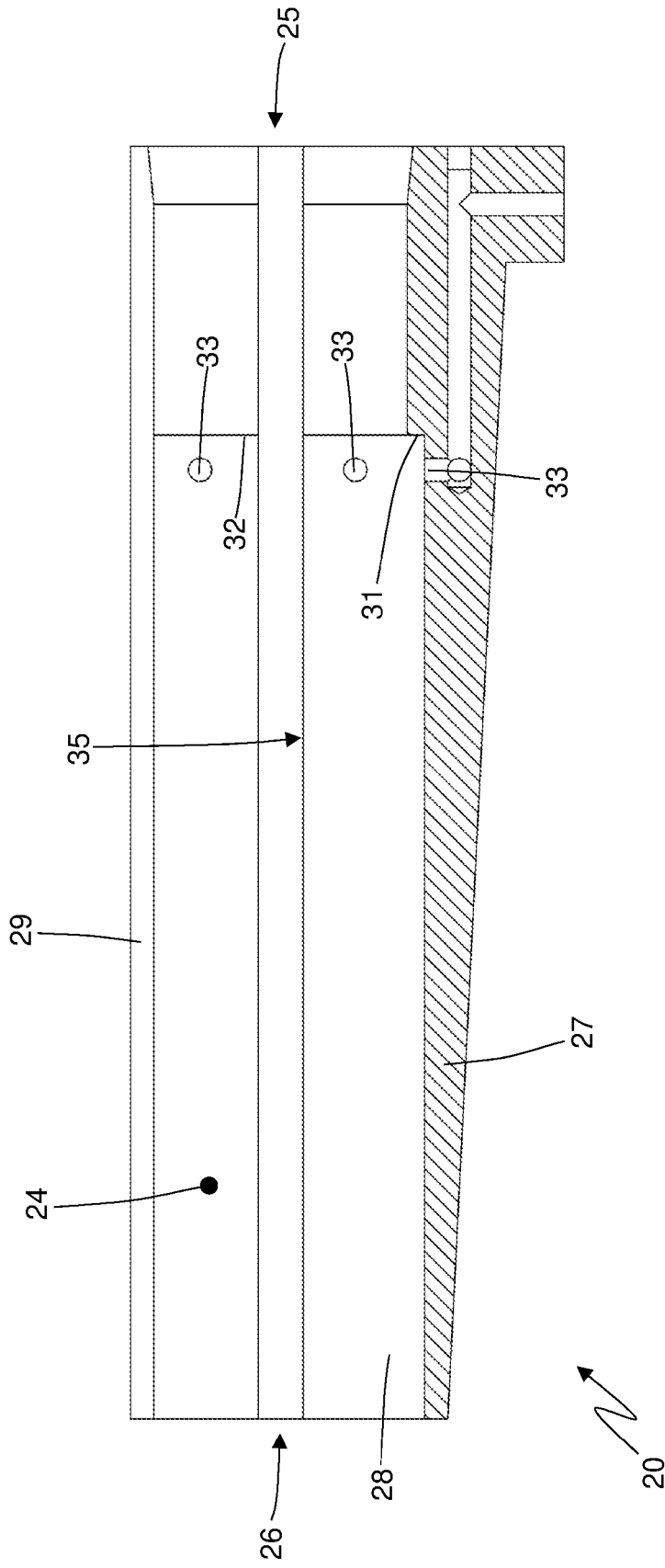


Fig. 15

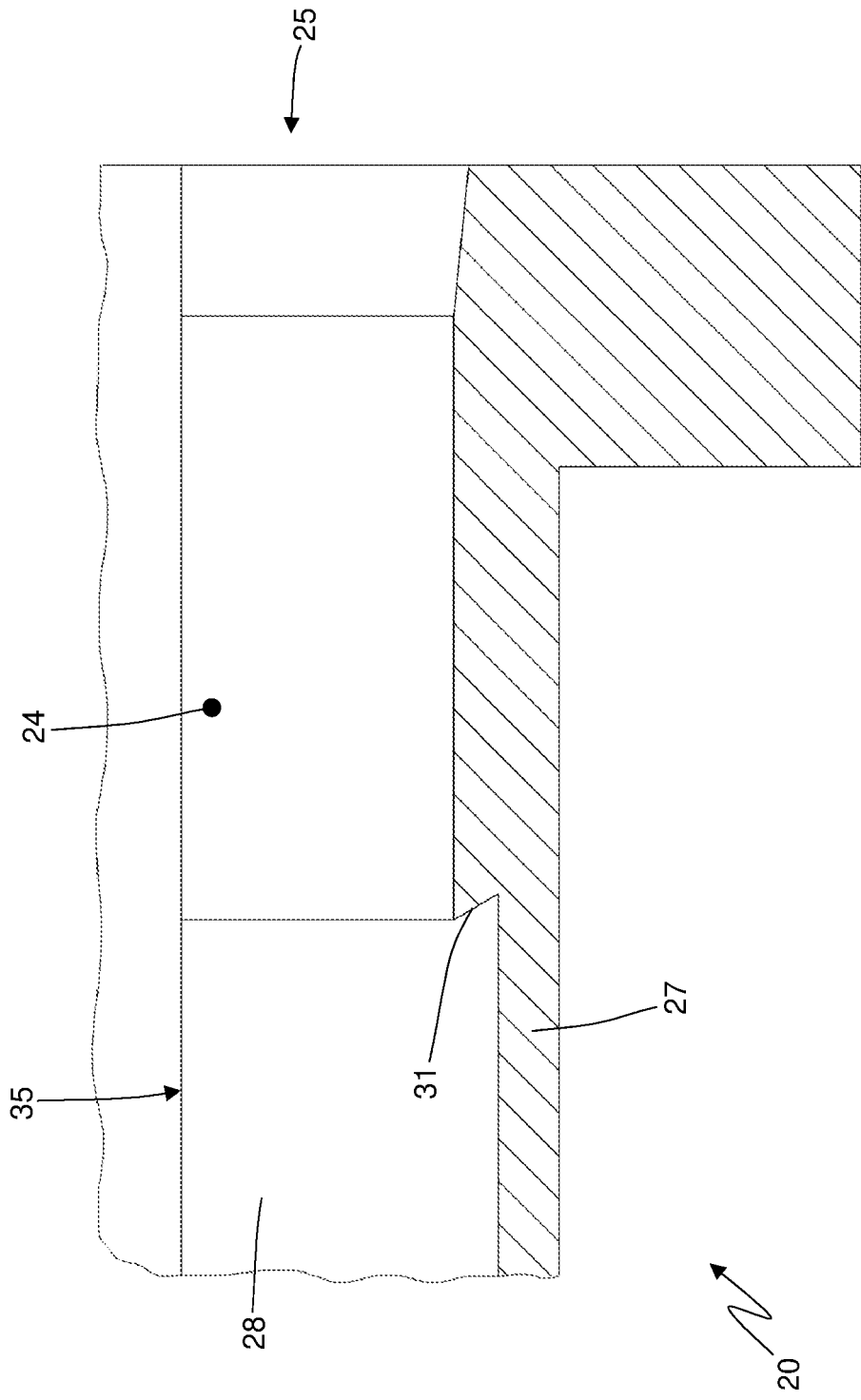


Fig. 16

REFERENCES CITED IN THE DESCRIPTION

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