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(54) Packet conveying assembly

(57) An assembly (27) for conveying packets (3), in particular packets (3) of cigarettes, wherein a movable U-shaped pocket (9) presents an outwardly-open cavity (16) and a retaining device (28) for retaining a packet (3) and a respective sheet (6) of wrapping material inside the cavity (16); the retaining device (28) presenting at

least one bracket (29), which is movable to and from an operating position closing a lateral opening (20) of the cavity (16) without interfering with any part of the sheet (6) of wrapping material.

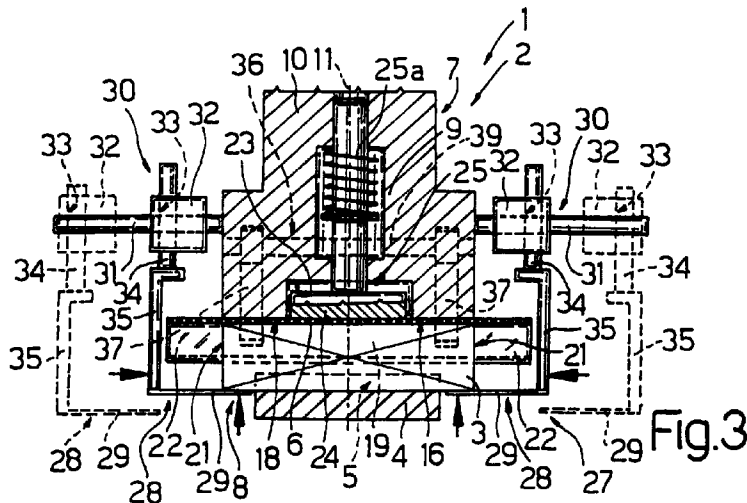


Fig.3

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Description

The present invention relates to a packet conveying assembly.

The present invention may be used to advantage on packet wrapping lines, particularly the wrapping lines of machines for cellophaning packets of cigarettes, to which the following description refers purely by way of example.

The wrapping lines of cellophaning machines are known to feature conveying assemblies connected to a conveyor and for feeding respective packets along the Wrapping line. Each assembly comprises a movable U-shaped pocket presenting a bottom surface, two longitudinal end openings, and a lateral inlet opening facing the bottom surface and for permitting at least partial insertion into the pocket of a packet together with a respective sheet of wrapping material folded into a U about the packet and presenting two opposite lateral portions projecting outwards of the packet and the respective lateral openings of the pocket.

On the wrapping lines of cellophaning machines, each packet and respective sheet is also retained inside the respective pocket by a retaining device normally defined by a rigid wall extending along the path of the pocket and separated from the bottom surface of the pocket by a distance approximately equal to but no less than the thickness of the packet measured perpendicularly to the bottom surface of the pocket.

The above known retaining device poses problems when the cellophaning machine is a continuous type, in which case, each conveying assembly is normally oscillated in relation to the conveyor, at least in the region of the transfer station at which the packet is transferred into the pocket, so as to impart a given orientation and/or movement to the pocket.

As such, the lateral surface of the packet opposite the one contacting the bottom wall of the pocket does not lie in a fixed plane in relation to the conveyor, and cannot mate accurately with a rigid outer wall by which the packet must be engaged immediately upon insertion inside the pocket. Moreover, the above known rigid wall normally also provides, in any case, for folding the sheet and, before engaging the packet, requires the performance of at least one initial folding operation, which, on a continuous machine, is difficult to perform immediately upon insertion of the packet into the pocket.

It is an object of the present invention to provide a packet conveying assembly suitable for use on continuous machines.

More specifically, it is an object of the present invention to provide a packet conveying assembly enabling a packet and respective sheet to be retained on the assembly immediately upon insertion of the packet inside the respective pocket, and involving no folding of the sheet.

According to the present invention, there is provided an assembly for conveying packets, in particular packets of cigarettes, the assembly comprising a movable

U-shaped pocket defining a cavity presenting a bottom surface, two longitudinal lateral surfaces facing each other, a lateral inlet opening facing the bottom surface, and two longitudinal end openings, said cavity at least partially receiving a respective said packet together with a respective sheet of wrapping material folded into a U about the packet and presenting two opposite lateral portions projecting outwards of the packet and the respective end openings of the cavity; and a retaining device for retaining the packet and respective sheet inside the cavity; characterized in that said retaining device comprises at least one bracket; and actuating means for moving said bracket along a given path to and from an operating position wherein the bracket closes said lateral opening; said path being, in use, such as not to interfere with said U-folded sheet.

According to a preferred embodiment of the above conveying assembly, said actuating means comprise a first guide integral with said pocket and extending longitudinally from a respective longitudinal end of the cavity, the first guide being located on the opposite side of said bottom surface to said bracket; a first powered slide mounted to slide along the first guide; a second guide fitted to the first slide and perpendicular to said bottom surface; and a second powered slide mounted to slide along the second guide; said bracket being connected to the second slide so as to move with the second slide between an idle position wherein the bracket is located outwards of the respective said end opening, and an operating position wherein at least part of the bracket faces said bottom surface; said first slide having been so adjusted as to permit said second slide to be positioned, in use and when said bracket is in the idle position, at a distance from said end opening greater than the length of the respective lateral portion of the respective sheet.

A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic side view of a portion of the wrapping line of a cellophaning machine featuring packet conveying assemblies in accordance with the teachings of the present invention;

Figure 2 shows a section along line II-II in Figure 1; Figure 3 shows a section along line III-III in Figure 1;

Figure 4 shows a section along line IV-IV in Figure 1.

Number 1 in the accompanying drawings indicates a continuous cellophaning machine comprising a line 2 for supplying and wrapping a succession of packets 3 of cigarettes.

As shown in Figure 1, line 2 comprises a conveyor 4 presenting a succession of pockets 5, each for receiving a packet 3 to be overwrapped with a respective sheet 6 of overwrapping material and laid flat inside pocket 5; and a wrapping conveyor wheel 7 substan-

tially tangent to conveyor 4 at a pickup station 8 and for wrapping sheets 6 about respective packets 3.

Wheel 7 comprises a number of conveying pockets 9 equally spaced with a spacing P, which may be varied to impart a given orientation and/or a given movement to packets 9. For which purpose, each pocket 9 is connected integral with one end of a respective arm 10 presenting an axis 11 extending substantially radially in relation to wheel 7, and which is oscillated in known manner by a known actuating device (not shown) about a respective axis 12 parallel to the axis of wheel 7 and crosswise to the travelling direction 13 of conveyor 4.

More specifically, and as shown in Figure 1, each pocket 9 is oscillated about respective axis 12 so that axis 11 is perpendicular to direction 13 as pocket 9 travels in the region of pickup station 8.

On the side facing radially outwards of wheel 7, each pocket 9 is defined by a cylindrical surface portion 14, which defines a suction seat 15 for a respective sheet 6, and is coaxial with an axis (not shown) of wheel 7 when respective axis 11 is positioned radially in relation to wheel 7. Seat 15 is broken, at an intermediate portion, by a cavity 16 substantially in the form of a rectangular parallelepipedon and for partially receiving a respective packet 3, and presents a length shorter than that of sheet 6 when measured parallel to its travelling direction 17. More specifically, the length of seat 15 is substantially equal to the length of a rear portion of sheet 6, the remaining front portion of which presents a length substantially equal to the distance between the front edge of cavity 16 and the front edge of seat 15.

As used above, the term "substantially equal" means that, if a sheet 6 is placed with its rear portion fully contacting seat 15 and astride cavity 16, and its front portion is folded backwards, i.e. in the opposite direction to direction 17, over the rear portion to form, on sheet 6, a curved intermediate portion projecting frontwards of seat 15, the front edge of sheet 6 is positioned substantially coincident with, but in any case frontwards of, the front edge of cavity 16.

Cavity 16 is substantially U-shaped, presents a longitudinal axis (not shown) extending parallel to the axis of wheel 7, and is defined by a bottom surface 18 perpendicular to axis 11, and by two longitudinal lateral surfaces 19 substantially perpendicular to surface 18 and defining a lateral opening 20 facing surface 18 and enabling insertion of a packet 3 and respective sheet 6 inside cavity 16. Together with surface 18, surfaces 19 also define two longitudinal end openings 21 enabling respective lateral end portions 22 of a respective sheet 6 folded into a U inside cavity 16 and interposed between respective packet 3 and surfaces 18 and 19 to project from cavity 16.

An intermediate portion of bottom surface 18 of cavity 16 presents a recess 23 for receiving the head 24 of a pusher 25, which is movable, in a direction parallel to axis 11 and by a spring 25a, between a withdrawn position wherein head 24 is housed entirely inside recess 23, and an extracted position wherein a curved

outer surface 26 of head 24 coincides with surface 14 of pocket 9.

Each pocket 9 forms part of a respective conveying assembly 27 for picking up a respective packet 3 off conveyor 4 at station 8, and which, in addition to pocket 9, also comprises a retaining device 28 for retaining packet 3 and sheet 6 inside cavity 16.

As shown in Figure 2, retaining device 28 comprises two substantially flat brackets 29, each of which is maintained parallel to bottom surface 18 of respective cavity 16 by a respective actuating device 30 interposed between bracket 29 and pocket 9. More specifically, brackets 29 - one of which may be dispensed with - are located on either side of pocket 9 and perpendicular to direction 17, and each actuating device 30 moves respective bracket 29 along a given path between an idle position (Figure 2) and an operating position (Figures 3 and 4).

In the idle position, each bracket 29 is located radially outwards of surface 14 and at a distance from surface 18 greater than the thickness of packet 3, and is located longitudinally (i.e. in a direction parallel to axis 12) outwards of respective portion 22. Conversely, in the operating position, each bracket 29 is located radially outwards of surface 14 and at a distance from surface 18 approximately equal to but no more than the thickness of packet 3, and presents an end portion directly facing surface 18. In said operating position, therefore, brackets 29 provide for closing cavity 16 and preventing any movement of packet 3 through opening 20.

As shown in Figures 2 to 4, each actuating device 30 comprises a guide 31 integral with respective pocket 9, extending longitudinally, in a direction parallel to axis 12, from a respective longitudinal end of cavity 16, and located on the opposite side of bottom surface 18 to respective bracket 29; a powered slide 32 fitted so as to slide along guide 31; a further guide 33 fitted to slide 32 and perpendicular to bottom surface 18; and a further powered slide 34 fitted so as to slide along guide 33. Slide 34 is fitted with an L-shaped arm 35, one portion of which is connected to slide 34, and a further portion of which extends parallel to axis 11 and outwards in relation to wheel 7, and is connected integrally, at its free end, to the outer end of respective bracket 29.

Actuating device 30 is so designed to prevent respective bracket 29 from interfering, in the idle position, with respective lateral portion 22 of a sheet 6 as this is inserted inside cavity 16, and to enable respective bracket 29 to move between said idle and operating positions without interfering with respective lateral portion 22 of the sheet 6 housed, in use, inside cavity 16. More specifically, slide 32 is so adjusted that, when bracket 29 is in the operating position, respective arm 35 is located a minimum distance from respective end opening 21, but at a distance greater than the length of respective lateral portion 22.

Pusher 25 forms part of a clamping device 36 fitted to each pocket 9 and which, in use, provides for clamp-

ing respective sheet 6 in relation to packet 3 when this is inserted inside respective cavity 16. As shown particularly in Figures 2 to 4, in addition to pusher 25, clamping device 36 also comprises at least one arm 37 (in the example shown, two pairs of opposed arms 37) housed inside a cavity 38 formed in pocket 9 and communicating with cavity 16 through a respective surface 19. Arm 37 is fitted to a shaft 39, which is fitted in rotary manner to pocket 9, parallel to axis 12, and is powered in known manner (not shown) so as to oscillate arm 37 between a withdrawn idle position (Figure 2) wherein arm 37 is housed completely inside cavity 38, and a forward operating position (Figures 3 and 4) wherein a free end portion of arm 37 penetrates inside cavity 16 to press a portion of sheet 6, located in use inside cavity 16, against a respective outer surface of packet 3 also located, in use, inside cavity 16.

Operation of one conveying assembly 27 will now be described relative to one packet 3 fed towards station 8 by conveyor 4.

As shown in Figure 1, as pocket 9 approaches station 8, arm 10 is rotated about axis 12 so that axis 11 is perpendicular to the travelling direction 13 of conveyor 4 at station 8; and the speed of conveyor 4 is so controlled that packet 3 is synchronized with pocket 9 in the region of station 8. As such, when the distance between surface 14 of pocket 9 and conveyor 4 equals the thickness of packet 3, packet 3 begins to penetrate inside cavity 16 and so fold into a U the sheet 6 contacting seat 15 of pocket 9. The insertion of packet 3 and respective sheet 6 inside cavity 16 is accompanied by pusher 25, the head 24 of which presses sheet 6 against packet 3 with the aid of spring 25a to prevent sheet 6 from moving in relation to packet 3.

The folding of sheet 6 is terminated by the time pocket 9 reaches station 8, where packet 3 presses sheet 6 against the bottom surface 18 of cavity 16. At this point, both shafts 39 and actuating devices 30 are activated, so that arms 37 clamp sheet 6 on to the respective lateral surfaces of packet 3, and slides 32 and 34 (Figure 3) move brackets 29 from the idle to the operating position wherein an end portion of each bracket 29 presses on the surface of packet 3 facing conveyor 4, so as to close opening 20, retain packet 3 inside cavity 16 and pocket 9, and so enable wheel 7 to remove packet 3 from conveyor 4 (Figure 4) as pocket 9 moves away from station 8.

In connection with the above, it should be pointed out that, at least at a given portion of each pocket 5, conveyor 4 is narrower than the length of packet 3 to enable brackets 29 in the operating position to engage packet 3 while it is still resting on conveyor 4 in station 8.

Moreover, actuating devices 30 are so designed that, as brackets 29 are moved from the idle to the operating position, not only brackets 29 but also any other parts of actuating devices 30 are prevented from interfering with sheet 6, and more specifically with lateral portions 22.

Claims

1. An assembly (27) for conveying packets (3), in particular packets (3) of cigarettes, the assembly (27) comprising a movable U-shaped pocket (9) defining a cavity (16) presenting a bottom surface (18), two longitudinal lateral surfaces (19) facing each other, a lateral inlet opening (20) facing the bottom surface (18), and two longitudinal end openings (21), said cavity (16) at least partially receiving a respective said packet (3) together with a respective sheet (6) of wrapping material folded into a U about the packet (3) and presenting two opposite lateral portions (22) projecting outwards of the packet (3) and the respective end openings (21) of the cavity (16); and a retaining device (28) for retaining the packet (3) and respective sheet (6) inside the cavity (16); characterized in that said retaining device (28) comprises at least one bracket (29); and actuating means (30) for moving said bracket (29) along a given path to and from an operating position wherein the bracket (29) closes said lateral opening (20); said path being, in use, such as not to interfere with said U-folded sheet (6).
2. An assembly as claimed in Claim 1, characterized by also comprising clamping means (36) which cooperate with a portion of said sheet (6) inside said cavity (16) to clamp the sheet (6) in position in relation to the respective packet (3).
3. An assembly as claimed in Claim 1 or 2, characterized in that said actuating means (30) comprise a first guide (31) integral with said pocket (9) and extending longitudinally from a respective longitudinal end of the cavity (16), the first guide (31) being located on the opposite side of said bottom surface (18) to said bracket (29); a first powered slide (32) mounted to slide along the first guide (31); a second guide (33) fitted to the first slide (32) and perpendicular to said bottom surface (18); and a second powered slide (34) mounted to slide along the second guide (33); said bracket (29) being connected to the second slide (34) so as to move with the second slide (34) between an idle position wherein the bracket (29) is located outwards of the respective said end opening (21), and an operating position wherein at least part of the bracket (29) faces said bottom surface (18); said first slide (32) having been so adjusted as to permit said second slide (34) to be positioned, in use and when said bracket (29) is in the idle position, at a distance from said end opening (21) greater than the length of the respective lateral portion (22) of the respective sheet (6).
4. An assembly as claimed in one of the foregoing Claims, characterized by comprising two said brackets (29) presenting respective said actuating

means (30); said brackets (29) being located at opposite longitudinal ends of said cavity (16).

5. An assembly as claimed in any one of the foregoing Claims from 2 to 4, characterized in that said clamping means (36) comprise at least a first pressing member (37) fitted to said pocket (9) and movable through a respective said lateral surface (19) of said cavity (16). 5
6. An assembly as claimed in Claim 5, characterized in that said clamping means (36) comprise at least two opposed said pressing members (37) movable through respective said lateral surfaces (19) of said cavity (16). 10 15
7. An assembly as claimed in one of the foregoing Claims from 2 to 6, characterized in that said clamping means (36) comprise a second pressing member (25) fitted to said pocket (9) and movable through said bottom surface (18). 20

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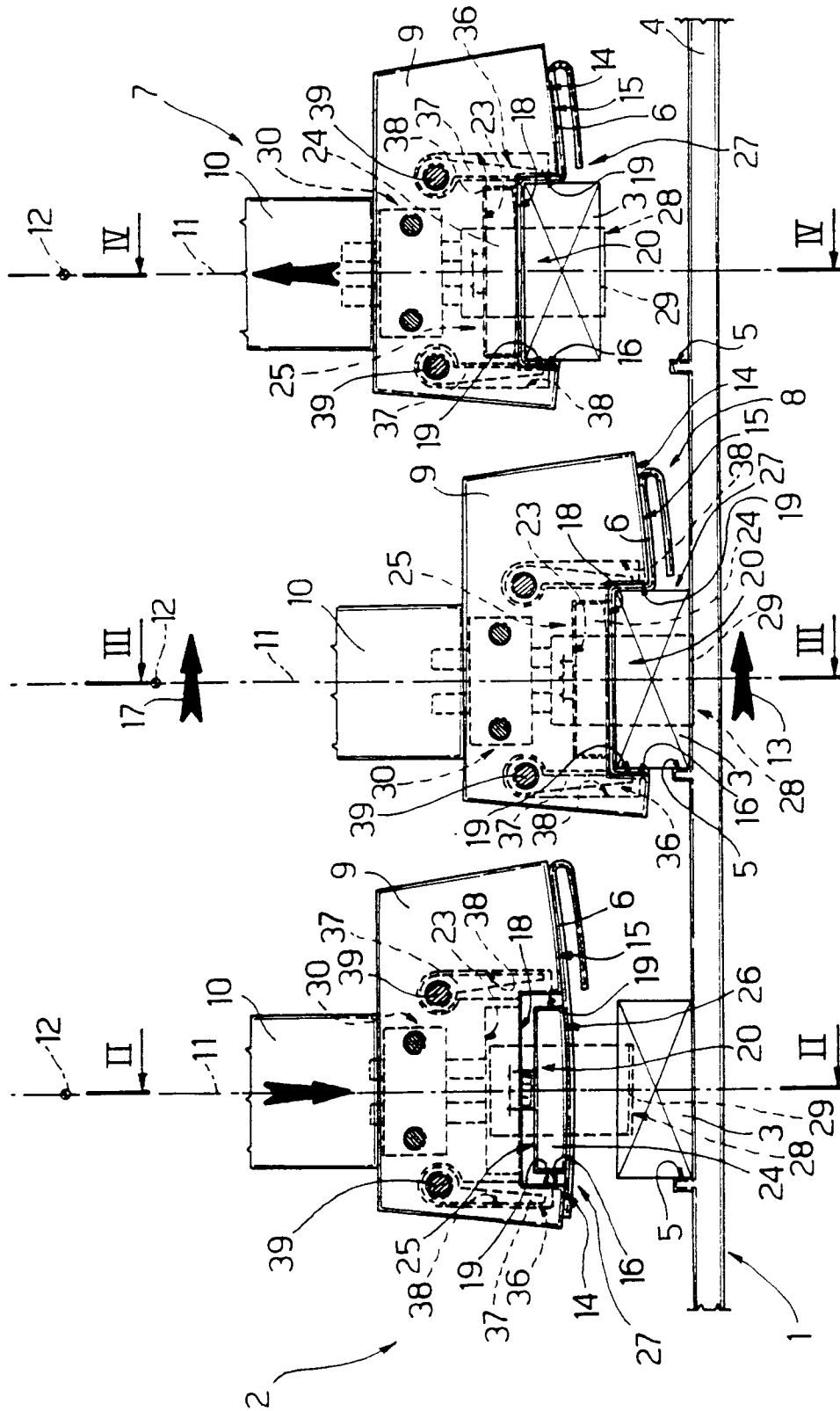
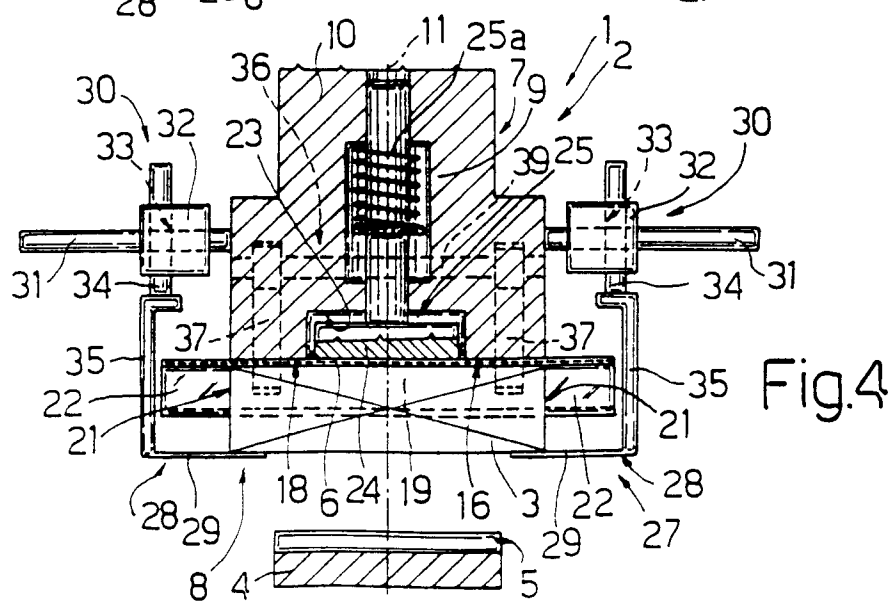
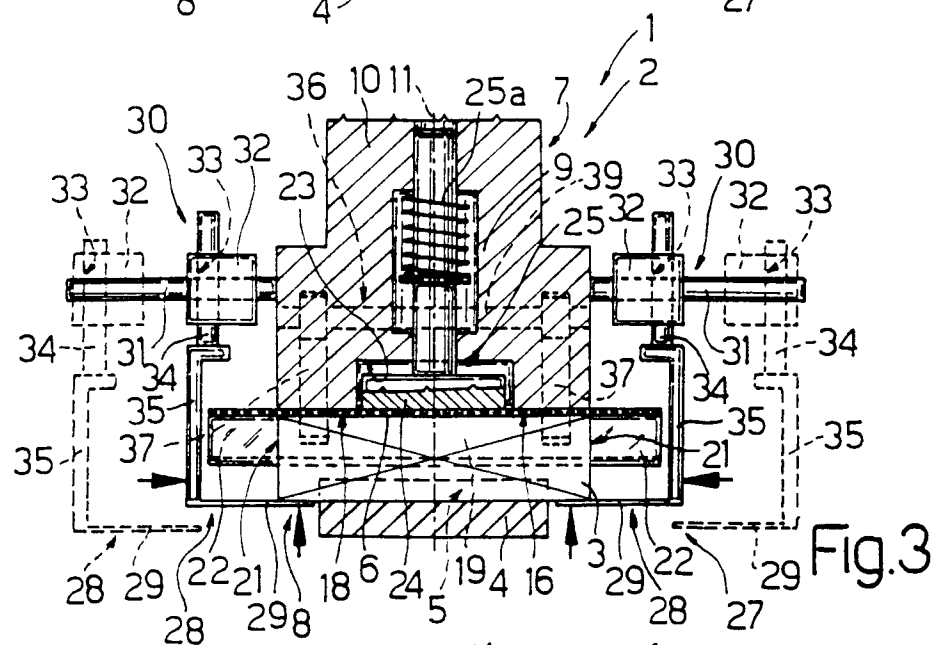
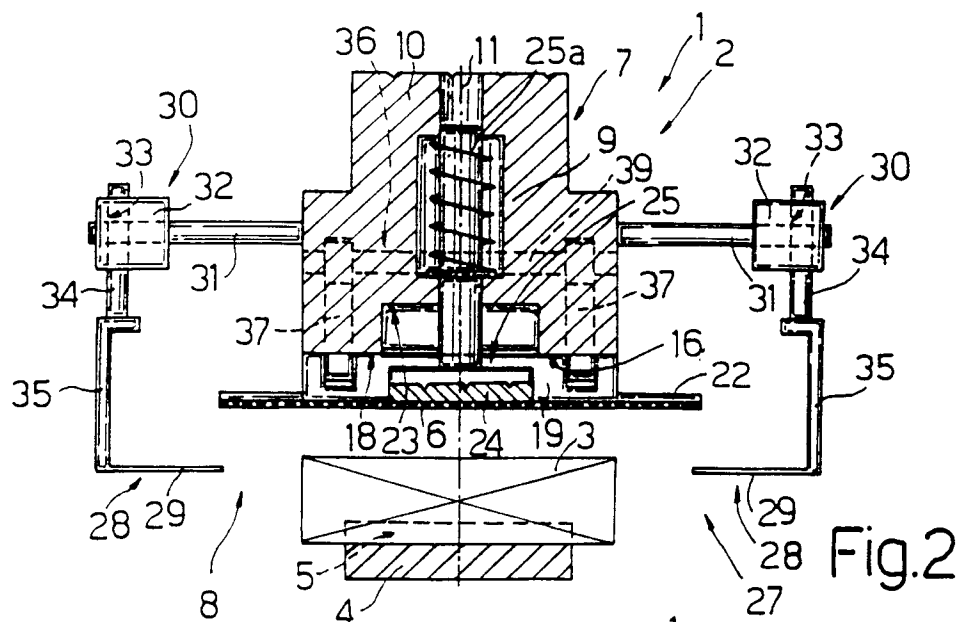


Fig.1





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 8922

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 340 526 A (FÖCKE & CO) * column 2, line 32 - column 4, line 3; figures *	1	B65B19/22 B65B11/30
A	EP 0 317 805 A (FÖCKE & CO) * column 3, line 20 - column 5, line 36; figures *	1	
A	GB 325 561 A (G. MARKS) * page 4, line 71 - page 5, line 23; figures 4,6 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		28 February 1997	Jagusiak, A
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