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(54) Arrangement for making textured multi film solid cleanser holders

(57) Arrangement (1) for making textured multi film solid cleanser holders (160), A solid cleanser feed conveyor (2) is horizontally rotatably mounted on a first frame work (3) and provided with a plurality of spaced solid cleanser holding pockets. A film feeding unit comprising one pair of film unwind top rolls (5,5) and one pair of film unwind bottom rolls (6,6) are rotatably mounted on a stand (7) at the feed end (8) of the feed conveyor. A pair of film lamination units (11a, 11b) each is mounted at the top and bottom of the first framework. A solid cleanser holder forming unit (31) is mounted on a second framework (35) located close to the discharge end of the feed conveyor (36). A solid cleanser holder sealing unit (41) a solid cleanser holder cutting unit (59), a film scoring unit (84) and a horizontally rotatable waste film carrying conveyor (98) are mounted on the second frame work in tandem with the solid cleanser holder forming unit. A plurality of film tensioning rollers (100) and a plurality of film puffing units (100a, 100b, 100c, 100d) are provided in the path of the textured film. An intermittent differential drive unit is connected to the feed conveyor, contra-rotatable conveyors, film scoring unit, waste film carrying conveyor and film pulling units (Fig1).

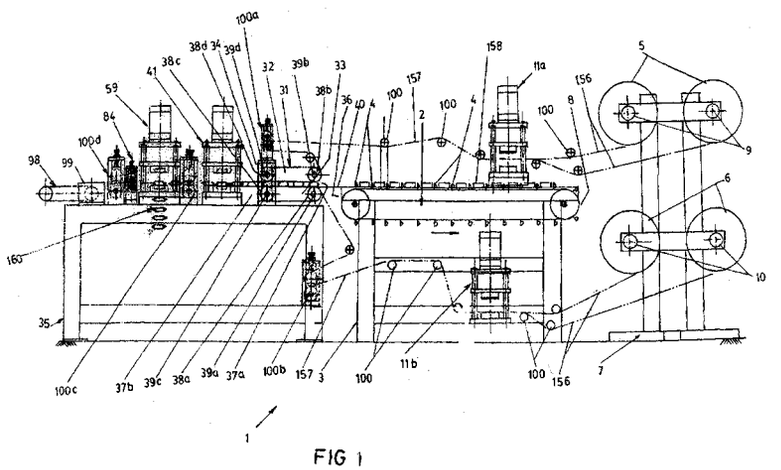


FIG 1

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Description

FIELD OF INVENTION

[0001] This invention relates to an arrangement for making textured multi film solid cleanser holders.

PRIOR ART

[0002] US Patent application No 09/503262 filed on 13th June 2001 relates to textured film solid cleanser holders and methods for the manufacture and use thereof. A textured film solid cleanser holder comprises a solid cleanser surrounded by at least one textured film having texture variations including at least one aperture.

OBJECTS OF INVENTION

[0003] An object of the invention is to provide an arrangement for making textured multi film solid cleanser holders.

[0004] Another object of the invention is to provide an arrangement for making frilled textured multi film solid cleanser holders.

DESCRIPTION OF INVENTION

[0005] According to the invention there is provided an arrangement for making textured multi film solid cleanser holders comprising a solid cleanser feed conveyor horizontally rotatably mounted on a first frame work and provided with a plurality of spaced solid cleanser holding pockets along the length thereof, a film feeding unit comprising atleast one pair of film unwind top rolls and at least one pair of film unwind bottom rolls rotatably mounted on a stand at the feed end of the feed conveyor, a pair of film lamination units each mounted at the top and bottom of the first framework, a solid cleanser holder forming unit comprising a pair of horizontally contra-rotatable conveyors disposed spaced one below the other and mounted on a second framework which is located close to the discharge end of the feed conveyor, a solid cleanser holder sealing unit, a solid cleanser holder cutting unit, a film scoring unit and a horizontally rotatable waste film carrying conveyor mounted on the second frame work in tandem with the solid cleanser holder forming unit and a plurality of film tensioning rollers and a plurality of film pulling units provided in the path of the textured film and an intermittent differential drive unit connected to the feed conveyor, contra-rotatable conveyors, film scoring unit, waste film carrying conveyor and film pulling units.

[0006] The term textured film and texture variations as used in the specification have the same meanings as given in the US Patent Application No 09/503262.

[0007] The solid cleanser referred to in the specification may be a soap or detergent cake or bar.

[0008] The following is a detailed description of the invention with reference to the accompanying drawings, in which :

Fig 1 is elevation of an arrangement for making textured multi film solid cleanser holders according to an embodiment of the invention;

Fig 2 is enlarged elevation of a film lamination unit of the arrangement of Fig 1;

Fig 3 is isomeric view of a movable laminator plate or stationary laminator plate of the film lamination unit of Fig 2;

Fig 4 is enlarged elevation of the solid cleanser holder sealing unit of the arrangement of Fig 1;

Fig 5 is front view of the movable die plate or stationary die plate of the solid cleanser holder sealing unit of Fig 4;

Fig 6 is enlarged elevation of the solid cleanser holder cutting unit of the arrangement of Fig 1;

Fig 7 is front view of the movable punch plate of the solid cleanser holder cutting unit of Fig 6;

Fig 8 is an enlarged view at X in Fig 6;

Figs 9 and 10 are elevation and side view of the film scoring unit of the arrangement of Fig 1;

Figs 11 and 12 are elevation and side view of a film pulling unit of the arrangement of Fig 1,

Fig 13 is schematic view of the intermittent differential drive unit of the arrangement of Fig 1;

Fig 14 is schematic view of the pneumatic cylinders of the film lamination units, solid cleanser holder sealing unit and solid cleanser holder cutting unit of the arrangement of Fig 1 connected to a pneumatic supply through 5-port 2-position solenoid operated direction control valves; and

Figs 15, 16, 17, 18 and 19 show the various positions of the Geneva drive in a cycle of operation of the arrangement of Fig 1;and

Fig 20 is crosssection of a multifilm solid cleanser holder made by the arrangement of Fig. 1.

[0009] As illustrated in Figs 1 to 20 of the accompanying drawings, the arrangement 1 comprises a solid cleanser feed conveyor 2 horizontally rotatably mounted on a first frame work 3 and provided with a plurality of spaced solid cleanser holding pockets along the length thereof (Fig 1). Each of the solid cleanser holding pock-

ets comprises a pair of spaced upright members 4 fitted across the length of the feed conveyor. A pair of film unwind top rolls 5,5 and a pair of film unwind bottom rolls 6,6 are rotatably mounted on a stand 7 at the feed end 8 of the feed conveyor. 9,9 represent the shafts of the film unwind top rolls. 10, 10 represent the shafts of the film unwind bottom rolls. 11a and 11b are a pair of film lamination units, each mounted at the top and bottom of the first framework 3. Each of the film lamination units comprises a first pneumatic cylinder 12 mounted on the top horizontal member 13 of a first supporting structure 14 and having a first piston 15 reciprocating therein (Figs 2 and 3). The first piston rod 16 protrudes down from the first cylinder through the top horizontal member of the first supporting structure. Air inlets cum outlets at the cylinder side and piston side of the first cylinder are marked 17 and 18 respectively. The cylinder side and piston side of the first pneumatic cylinder are connected to a pneumatic supply 19 through a 5 port 2-position solenoid operated direction control valve 20 and a control valve 21 (Fig 14). The 5 ports of the valve 20 are marked a, b, c, d, and e. The solenoid of the valve 20 is marked 22. 23 is a movable laminator plate fitted to a first guide plate 24 which in turn is fitted to the protruding end of the first piston rod (Figs 1 and 2). The first guide plate is up and down slidably engaged over guide rods 25 of the first supporting structure through bushes 26 fitted to the guide plate. 27 is a stationary laminator plate fitted at the base 28 of the first supporting structure aligned with the movable laminator plate. Both the movable laminator plate and stationary laminator plate are provided with a pair of spaced laminating ridges 29 across the length thereof (Fig 3). Both the movable laminator plate and stationary laminator plate are also provided with electric heating elements comprising conductors 30 running therethrough and connected to an AC supply (not shown) through thermostat (not shown) and temperature controller (not shown). 31 is a solid cleanser holder forming unit comprising a pair of horizontally contrarotatable conveyors 32 and 33 disposed spaced one below the other and mounted on an upright structure 34 of a second framework 35 which is located close to the discharge end 36 of the feed conveyor (Fig 1). The bottom and top rollers at the feed end 37a and discharge end 37b of the contrarotateble conveyors are marked 38a and 38b and 38c and 38d respectively. The shafts of the rollers 38a, 38b, 38c and 38d are marked 39a, 39b, 39c and 39d respectively. The first framework 3 is provided with a flat protrusion 40 at the discharge end 36 of the feed conveyor extending to the feed end 37a of the contrarotatable conveyors. 41 is a sold cleanser holder sealing unit mounted on the second framework 35 and comprising a second pneumatic cylinder 42 mounted on the top horizontal member 43 of a second supporting structure 44 and having a second piston 45 reciprocating therein (Figs 1 and 4). The second piston rod 46 protrudes down from the second cylinder through the top horizontal member of the second supporting structure. Air inlets cum outlets at the cylinder side and piston side of the second cylinder side are marked 47 and 48 respectively. The cylinder side and piston side of the second cylinder are connected to the pneumatic supply through a 5 port 2-position solenoid operated direction control 49 and control valve 21 (Fig 14). The 5 ports of the valve 49 are marked a, b, c, d, and e. The solenoid of the valve 49 is marked 50. 51 is a movable die plate fitted to a second guide plate 52 which in turn is fitted to the protruding end of the second piston rod and up and down movably engaged over guide rods 53 of the second supporting structure through bushes 54 fitted to the guide plate 52. 55 is a stationary die plate fitted at the base 56 of the second supporting structure aligned with the movable die plate. The movable die plate 51 and stationary die plate 55 are formed with die stockets 57 corresponding to the size of the solid cleanser holders and provided with electric heating elements comprising conductors 58 around the sockets and connected to the AC supply through thermostat (not shown) and temperature controller (not shown). 59 is a solid cleanser holder cutting unit mounted on the second framework 35 and comprising a third pneumatic cylinder 60 mounted on the top horizontal member 61 of a third supporting structure 62 and having a third piston 63 reciprocating therein (Figs 1 and 6). The third piston rod 64 protrudes down from the third cylinder through the top horizontal member of the third supporting structure. Air inlets cum outlets at the cylinder side and piston side are marked 65 and 66 respectively. The cylinder side and piston side of the third cylinder are connected to the pneumatic supply through 5 port 2-position solenoid operated direction control valve 67 and control valve 21 (Fig 14). The five ports of the valve 67 are numbered a, b, c, d and e. Solenoid of the valve 67 is marked 68. 69 is a movable punch plate fitted to a third guide plate 70 which in turn is fitted to the protruding end of the third piston rod and up and down slidably engaged over guide rods 71 of the third supporting structure through bushes 72 fitted thereto. The movable punch plate is provided with a pair of holes 73 defining neck portions 74 (Fig 6). 75, 75 are a pair of screw members each being movably disposed in each of the holes with the heads of the screw members adapted to abut against the shoulders 77 of the neck portions (Fig 8). 78 is a retainer flange provided at the front side of the punch plate in thread engagement with the edges of the screw members. The film retainer flange is held stressed by tension springs 79 disposed over the screw members and located between the punch plate and the film retainer flange. 80 is a stationary die plate fitted at the base 81 of the third supporting structure aligned with the movable punch plate. The movable punch plate and stationary die plate are formed with die cavities 82 which are larger than the die sockets in the movable die plate and stationary die plate of the solid cleanser holder sealing unit and are corresponding to the profiles of the edges or frills of the solid cleanser holders. The bottom of the die cavity 82 in the stationary

die plate 80 is open. 83 is an opening in the base of the third supporting structure corresponding to the open bottom die cavity in the stationary die plate 80. 84 is *a* film scoring unit mounted on the second framework 35 and comprising an anvil roller 85 whose shaft 86 is rotatably supported in a pair of first vertical oblong slots 87 provided in a pair of spaced first vertical side plates 88 of a fourth supporting structure 89 (Figs 1, 9 and 10). The bearings 90 of the anvil roller shaft are located at the bottom of the first vertical oblong slots. Therefore, the anvil roller remains in position. 90a is a driver gear fitted on the shaft 86 at its one end. 91 is a rotary disc cutter disposed across and close to the anvil roller and having its shaft 92 fitted with bearings 93 mounted in the first vertical oblong slots in the first vertical plates. 93a is a driven gear fitted on shaft 92 at its one end. Gears 90a and 93a are in mesh with each other (Fig 9). The bearings 93 are stressed by tension springs 94 in abutment with first setting screws 95 secured through the top horizontal member 96 of the fourth supporting structure in thread engagement therewith. The first setting screws are provided with first lock nuts 97. The clearance between the rotary disc cutter and the anvil roller is adjusted by moving the rotary cutter down by turning and moving down the setting screws against the tension springs and stressing or compressing the tension springs. The setting screws are locked in position with the lock nuts against the horizontal member of the fourth supporting structure. 98 is a horizontally rotatable waste film carrying conveyor mounted between a pair of upright members 99 of the second framework 35. Only one of the upright members is seen in Fig 1 as the other is behind the one shown in Fig 1. The solid cleanser holder sealing unit, solid cleanser holder cutting unit, film scoring unit and film carrying conveyor are in tandem with the solid cleanser holder forming unit. 100 represents a plurality of film tensioning rollers. 100a, 100b, 100c and 100 d represent a plurality of film pulling units (Fig 1). Film pulling unit 100a is mounted on the upright structure 34. Film pulling units 100b and 100c and 100d are mounted directly on the second framework 35. Each of the film pulling units 100a, 100b, 100c and 100d comprises a pair of horizontally contrarotatable rollers 101 and 102 disposed one below the other in contact (Figs 11 and 12). The shaft 103 of the bottom roller 101 is fitted with bearings 104 at the ends thereof which are located in a pair of second vertical oblong slots 105 provided in a pair of spaced second vertical side plates 106 of a fifth supporting structure 107. The bearings 104 of the shaft 103 are located at the bottom of the oblong slots 105. Therefore, the bottom roller 101 remains in position. 104a is a driver gear fitted at one end of the shaft 103. The shaft 108 of the top roller 102 is fitted with bearings 109 at the ends thereof which are located in the second vexticai oblong slots 105. 109a is a driven gear fitted at one end of the shaft 108. Gears 104a and 109a are in mesh with each other (Figs 11 and 12). 110, 110 are pair of second setting screws whose edges are in contact with the bearings 109. The second setting screws 110 are secured through the top horizontal member 111 of the fifth supporting structure in thread engagement therewith. The second setting screws are provided with second lock nuts 112. The clearance between the top roller and bottom roller is adjustable by turning and moving down the second setting screws against the tension springs and stressing or compressing the tension springs. The second setting screws are locked in position with the locknuts against the horizontal member of the fifth supporting structure, 113 is a geared motor whose shaft is marked 114, 115 is a six station Geneva drive compressing a Geneva wheel 116 and a Geneva driver 117. Geneva wheel shaft is marked 118. Six slots of the Geneva wheel are marked 119a, 119b, 119c, 119d, 119e and 119f. Geneva driver shaft is marked 120, 121 is pinion of the Geneva driver. 122 and 123 are sprockets mounted on the motor shaft and Geneva driver shaft, respectively and interconnected by chain 124, The teeth ratio of sprockets 122 and 123 is 2:3. 125 is a sprocket mounted on the Geneva wheel shaft. 126, 127, 128, 129 and 130 are sprockets mounted on the shaft 39c of roller 38c of conveyor 33. Sprockets 125 and 128 are interconnected by chain 132, 133 is a driver roller shaft of the feed conveyor 2, 134 is a sprocket mounted on the drive roller shaft 133. Sprockets 126 and 134 are interconnected by chain 135. 136 is a sprocket mounted on the driver shaft 137 of the film pulling unit 100a. Sprockets 129 and 136 are interconnected by chain 138, 139 is a sprocket mounted on the driver shaft 140 of the film pulling unit 100b. Sprockets 130 and 139 are interconnected by chain 141, 142 and 143 are sprockets mounted on the driver shaft 144 of the film pulling unit 100c. Sprockets 127 and 143 are interconnected by chain 145, 146, 147 and 148 are sprockets mounted on the driver shaft 149 of the film pulling unit 100d. Sprockets 142 and 146 are interconnected by chain 149, 150 is a sprocket mounted on the driver shaft 151 of the waste film carrying conveyor 94. Sprockets 147 and 150 are interconnected by chain 152. 153 is a sprocket mounted on the driver shaft 154 of the film scoring unit 84. Sprockets 148 and 153 are interconnected by chain 155. The teeth ratio of sprocket 125 to each of sprockets 126 to 130, 134, and to each of sprockets 136, 139, 142, 143, 146, 147, 148, 150 and 153 is 1:1. Teeth ratio of gears 90a and 104a is also 1: 1. The operation of the arrangement of the invention is in a cyclic manner as described below during which valve 21 remains open.

[0010] At the beginning of a half cycle of operation of the arrangement, pinion 121 of the Geneva driver 117 is positioned at the mouth of slot 119a of the Geneva wheel 116 (Fig 15). During rotation of the Geneva driver in the anticlockwise direction pinion 121 travels away from slot 119a as shown in Figs 16 and 17 and no drive is transmitted to the Geneva wheel 116 and the solid cleanser feed conveyor 2, solid cleanser holder forming unit 31 comprising contrarotatable conveyors 32 and 33,

film pulling units 100a, 100b, 100c and 100d, film scoring unit 84 and waste film carrying conveyor 98 remain stationary. Ports a and e and ports b and d of valves 20 of the film lamination units 11a and 11b are connected. Air flows into the piston side and air flows out into the atmosphere from the cylinder side of the cylinders 12. Pistons 15 of the cylinders 12 alongwith the movable laminator plates 23 move down towards the stationary laminator plates 27 of the film lamination units. Both the movable laminator plates 23 and stationary laminator plates 27 are being heated by the electric conductors 30 running therethrough. Both the films 156, 156 from top unwind rolls 5 positioned in the top lamination unit 11a are hot passed together and laminated into a single top film along the lamination ridges 29 of the movable laminator plate 23 and stationary laminator plate 27 of the top lamination unit 11a. Similarly both the films 156, 156 from the bottom unwind rolls 6 positioned in the bottom lamination unit 11b are hot pressed together and laminated into single bottom film along the lamination ridges 29 of the movable laminator plate 23 and stationary laminator plate 27 of the bottom lamination unit 11b. The laminated top and bottom films emerging from the lamination units are marked 157. The films on the unwind rolls may be of the same or different materials, textures or colours as required. Ports b and d and ports a and e of valve 49 of the solid cleanser sealing unit 41 are connected. Air flows into the piston side and air flows out into the atmosphere from the cylinder side of the cylinder 42 of the solid cleanser sealing unit 41. The piston 45 of cylinder 42 along with the movable die plate 51 moves down towards the stationary die plate 55. Both the die sockets 57 in the movable die plate 51 and stationary die plate 55 are being heated by the electric conductors 58 running around them. The movable die plate 51 closes on the stationary die plate 55 and holds the solid cleanser holder positioned therebetween within the die sockets 57 and heat seals together the bottom and top films around the solid cleanser at the peripheries of the die sockets. Ports b and d and ports a and e of valve 67 of solid cleanser holder cutting unit are connected. Air flows into the piston side and air flows out into the atmosphere from the cylinder side of cylinder 60 of the solid cleanser holder cutting unit. The piston 63 of cylinder 60 along with the punch plate 69 moves down towards the stationary die plate 80. The punch plate 69 closes on the die plate 80 and holds the solid cleanser holder positioned therebetween within the die cavities and cuts the solid cleanser holder at the peripheries of the die cavities. On being cut and separated from the bottom and top films, the solid cleanser holder 160 falls down through the open bottom of the die cavity 82 in the die plate 80 and corresponding opening 83 in the base 81 of the supporting structure 62. While the punch pate 69 closes on the die plate 80 and cuts and separates the solid cleanser holder from the films, the retainer flange 78 presses against the films under spring tension and holds the films in position to facilitate cutting of the solid cleanser holders. The retainer flange slides in and out on die punch plate due to its being tensioned by springs 79 and fixed to the screw members 75 which are movably disposed in the holes 73. The outward movement of the screw members in holes 73 and hence that of the retainer flange is restricted by shoulders 77 as the heads of the screw members abuts the shoulders at the extreme outward position of the screw members. The size of the edges or frills of the solid cleanser holder from the sealing point thereof depends on the larger peripheries of the die cavities as compared to the die sockets. At the end of the half cycle of operation of the arrangement, the position of the pinion 121 of the Geneva driver 117 is as shown in Fig 17. The pinion 121 is about to enter slot 119f of the Geneva wheel 116. During further rotation of the Geneva driver in the anticlockwise direction the pinion 121 travels into the slot 119f of the Geneva wheel (Fig 18) and travels back from the slot 119f of the Geneva wheel and positions itself at the mouth of slot 119f of the Geneva wheel as shown in Fig 19. During this half cycle drive is transmitted to the Geneva wheel and it rotates in the clockwise direction. Consequently drive is transmitted to the solid cleanser feed conveyor 2, solid cleanser holder forming unit 31 comprising contrarotatable conveyors 32 and 33, film pulling units 100a, 100b, 100c and 100d and film scoring unit 84 and waste film carrying unit 98. Solid cleansers 158 being fed from the feed end of the conveyor 2 in the pockets formed by pairs of spaced upright members 4, are moved forward by the feed conveyor. Due to momentum of movement of the feed conveyor, the solid cleanser at the discharge end of the infeed conveyor is pushed by the advancing upright member 4 at the rear side of the solid cleanser 158 into the laminated bottom film 157 at the feed end 37a between the contmrotatable conveyors 32 and 33 over the flat protrusion 40. The conlrarotating rollers of the film pulling units 100a and 100b pull the laminated bottom and top films from the lamination units 11a and 11b and keep them taut. In the solid cleanser holder forming unit 31, the bottom film 157 carrying the solid cleansers and the top film 157 overlying the solid cleansers form holders for the solid cleansers and are moved forward by and between the contrarotating conveyors 32 and 33. The bottom and top films having the solid cleansers interposed therebetween enter the solid cleanser holder sealing unit 41. The contrarotating rollers of the film pulling unit 100c pull the bottom and top films with the sealed solid cleansers holders emerging from the solid cleanser holder sealing unit and feed them to the solid cleanser cutting unit 59 one at a time. The contrarotating rollers of the film pulling unit 100d pull the bottom and top films from the solid cleanser cutting unit 59 through the film scoring unit 84 in which the rotary disc cutter 91 cuts or scores the waste films into two lengthwise, which remain as webs between adjacent cutouts of solid cleanser holders after they are cut and separated. The waste films emerging from the pulling unit 100d are carried onto the waste film carrying

conveyor 98. The waste films are cut and removed from the waste film carrying conveyor as and when required. Simultaneously ports b and c and ports a and d of valves 20 are connected. Air flows into the cylinder side and air flows out into the atmosphere from the piston side of the cylinders 12 of the film lamination units 11a and 11b. The piston 15 of the cylinders 12 move up into their original position. Ports b and c and ports a and d of valve 49 are connected. Air flows into the cylinder side and air flows out into the atmosphere from the piston side of cylinder 42 of the solid cleanser holder sealing unit 41. The piston 45 of cylinder 42 moves up to its original position. Ports b and c and ports a and d of value 67 are connected. Air flows into the cylinder side and air flows out into the atmosphere from the piston side of cylinder 60 of the solid cleanser holder cutting unit 59. The piton 63 of the cylinder 60 moves up to its original position. The arrangement is now ready for the next cycle of operation.

[0011] Due to the intermittent drive and feeding of solid cleansers into the solid cleaner holder forming unit in a cycle of operation of the arrangement a gap is maintained between two solid cleansers in the solid cleanser holder forming unit. The temperature controllers sense the temperatures of the laminator plates and movable die plate and corresponding stationary die plate through the thermostats and cut of the power supply when the temperatures exceed the set limits. The film tensioning rollers keep the films under tension. The bushes are to minimise friction between the guide plates and respective guide rods and render the up and down movement of the guide plates smooth.

[0012] The film lamination units, solid cleanser holder forming unit, solid cleanser holder sealing unit, solid cleanser holder cutting unit, film pulling units, film scoring unit and solid cleanser pockets may be of different constructions. There may be more than four film pulling units. Instead of pneumatic cylinders, hydraulic cylinders may be used. There may be more than two film unwind top rolls and more than two film unwind bottom rolls and corresponding number of films to be laminated. The waste film carrying conveyor and film scoring unit are optional. Instead of waste film carrying conveyor some other arrangement may be used to carry the used films. The sizes and profiles of the die sockets and die cavities will change depending upon the sizes and profiles of the solid cleansers and solid cleanser holders. The arrangement may include a solid cleanser feeding unit. Instead of film unwind rolls, the film feeding arrangement may be different. Such variations of the invention are to be construed and understood to be within the scope of the invention.

Claims

1. Arrangement for making textured multi film solid cleanser holders comprising a solid cleanser feed conveyor horizontally rotatably mounted on a first frame work and provided with a plurality of spaced solid cleanser holding pockets along the length thereof, a film feeding unit comprising atleast one pair of film unwind top rolls and at least one pair of film unwind bottom rolls rotatably mounted on a stand at the feed end of the feed conveyor, a pair of film lamination units each mounted at the top and bottom of the first framework, a solid cleanser holder forming unit comprising a pair of horizontally contrarotatable conveyors disposed spaced one below the other and mounted on a second framework which is located close to the discharge end of the feed conveyor, a solid cleanser holder sealing unit, a solid cleanser holder cutting unit, a film scoring unit and a horizontally rotatable waste film carrying conveyor mounted on the second frame work in tandem with the solid cleanser holder forming unit and a plurality of film tensioning rollers and a plurality of film pulling units provided in the path of the textured film and an intermittent differential drive unit connected to the feed conveyor, contra-rotatable conveyors, film scoring unit, waste film carrying conveyor and film pulling units.

2. Arrangement as claimed in claim 1, wherein each of the solid cleanser holding pockets comprises a pair of spaced upright members fitted across the length of the feed conveyor and the first framework is provided with a flat protrusion at the discharge end of the feed conveyor extending to the feed end of the contrarotatable conveyors.

3. Arrangement as domed in claim 1 or 2, wherein each of the film lamination units comprises a first pneumatic cylinder mounted on the top horizontal member of a first supporting structure and having a first piston reciprocating therein, the first piston rod protruding down from the first cylinder through the top horizontal member of the first supporting frame, the cylinder side and piston side of the first cylinder being connected to a pneumatic supply through a 5-port 2-position solenoid operated direction control valve, a movable laminator plate fitted to a first guide plate which in turn is fitted to the protruding end of the first piston rod and up and down slidably engaged over guide rods of the first supporting structure, a stationary laminator plate fitted at the base of the first supporting structure aligned with the movable laminator plate, the movable laminator plate and stationary laminator plate being provided with a pair of spaced laminating ridges across the length thereof and electric heating elements connected to an AC supply through thermostat and temperature controller.

4. Arrangement as claimed in any one of claims 1 to 3, wherein the solid cleanser holder sealing unit

comprises a second pneumatic cylinder mounted on the top horizontal member of a second supporting structure and having a second piston reciprocating therein, the second piston rod protruding down from the second cylinder through the top horizontal member of the second supporting structure, the cylinder side and piston side of the second cylinder being connected to the pneumatic supply through a 5-port 2-position solenoid operated direction control valve, a movable die plate fitted to a second guide plate which in turn is fitted to the protruding end of the second piston rod and up and down slidably engaged over guide rods of the second supporting structure, a stationary die plate fitted at the base of the second supporting structure aligned with the movable die plate, the movable die plate and stationary die plate having formed with the sockets corresponding to the size of the solid cleanser holders and provided with electric heating elements connected to the AC supply through thermostat and temperature.

5. Arrangement as claimed in claim 4 or 5, wherein the electric heating elements comprise electric conductors.

6. Anangement as claimed in any one of claims 1 to 5, wherein the solid cleanser holder cutting unit comprises a third pneumatic cylinder mounted on the top horizontal member of a third supporting structure and having a third piston reciprocating therein, the third piston rod protruding down from the third cylinder through the top horizontal member of the third supporting structure, the cylinder side and piston side of the third cylinder being connected to the pneumatic supply through a 5-port 2-position solenoid operated direction control valve, a movable punch plate fitted to a third guide plate which in turn is fitted to the protruding end of the third piston rod and up and down slidably engaged over guide rods of the third supporting structure, the movable punch plate being provided with a film retainer flange at the front side, the film retainer flange being movably held tension spring stressed, a stationary die plate fitted at the base of the third supporting structure aligned with the movable punch plate, the movable punch plate and corresponding stationary die plate having formed with die cavities larger the die sockets in the movable die plate and corresponding stationary die plate registering with the profiles of the edges or frills of the solid cleanser, the bottom of the die cavity in the stationery die plate being open and the base of the third supporting structure being provided with a corresponding opening therethrough.

7. Arrangement as claimed in claim 6, wherein the punch plate is provided with a pair of holes defining neck portions, a pair of screw members each being movably disposed in each of the holes with the heads of the screw members adapted to abut against the shoulders of the neck portions, the film retainer flange being in thread engagement with the edges of the screw members and tension spring stressed against the movable punch plate.

8. Arrangement as claimed in any one of claims 1 to 7, wherein the film scoring unit comprises an anvil roller whose shaft is rotatably supported in a pair of first vertical oblong slots provided in a pair of spaced first vertical side plates of a fourth supporting structure, a rotary disc cutter disposed across and close to the anvil roller and fitted on a shaft rotatably height adjustably mounted in the first vertical oblong slots in the first vertical side plates and stressed by tension springs in abutment with the edges of first setting screws secured through the top horizontal member of the fourth supporting structure in thread engagement therewith and provided with first lock nuts.

9. Arrangement as claimed in any one of claims 1 to 8, wherein each of the film pulling units comprises a pair of horizontally contrarotatable rollers disposed one below the other in contact and having their shafts rotatably mounted in a second pair of second vertical oblong slots provided in a pair of spaced second vertical side plates of a fifth supporting structure, the top roller being height adjustable with second setting screws secured through the top horizontal member of the fifth supporting structure in thread engagement therewith, the edges of the second setting screws being in contact with the top roller shaft and the second setting screws being provided with second lock nuts.

10. Arrangement as claimed in any one of claims 1 to 8, wherein the intermittent differential drive unit comprises a geared motor connected to the feed conveyor, contrarotatable conveyors, film scoring unit, waste film carrying conveyor and film pulling units through sprockets and chains, and gears and a 6-station Geneva drive, in which the teeth ratio of the sprocket on the geared motor shaft to the sprocket on the Geneva driver shaft is 2:3 and the teeth ratio of the sprocket on the geared motor shaft to each of the sprockets of the feed conveyor, contrarotatable conveyors, film scoring unit waste film carrying conveyor and each of the film pulling units is 1:1 and the teeth ratio of the gears of the shafts of the film scoring unit and each pulling unit is 1:1.

11. Arrangement for making textured multi film solid cleanse holders substantially as herein described particularly with reference to Figs 1 to 20 of the accompanying drawings.

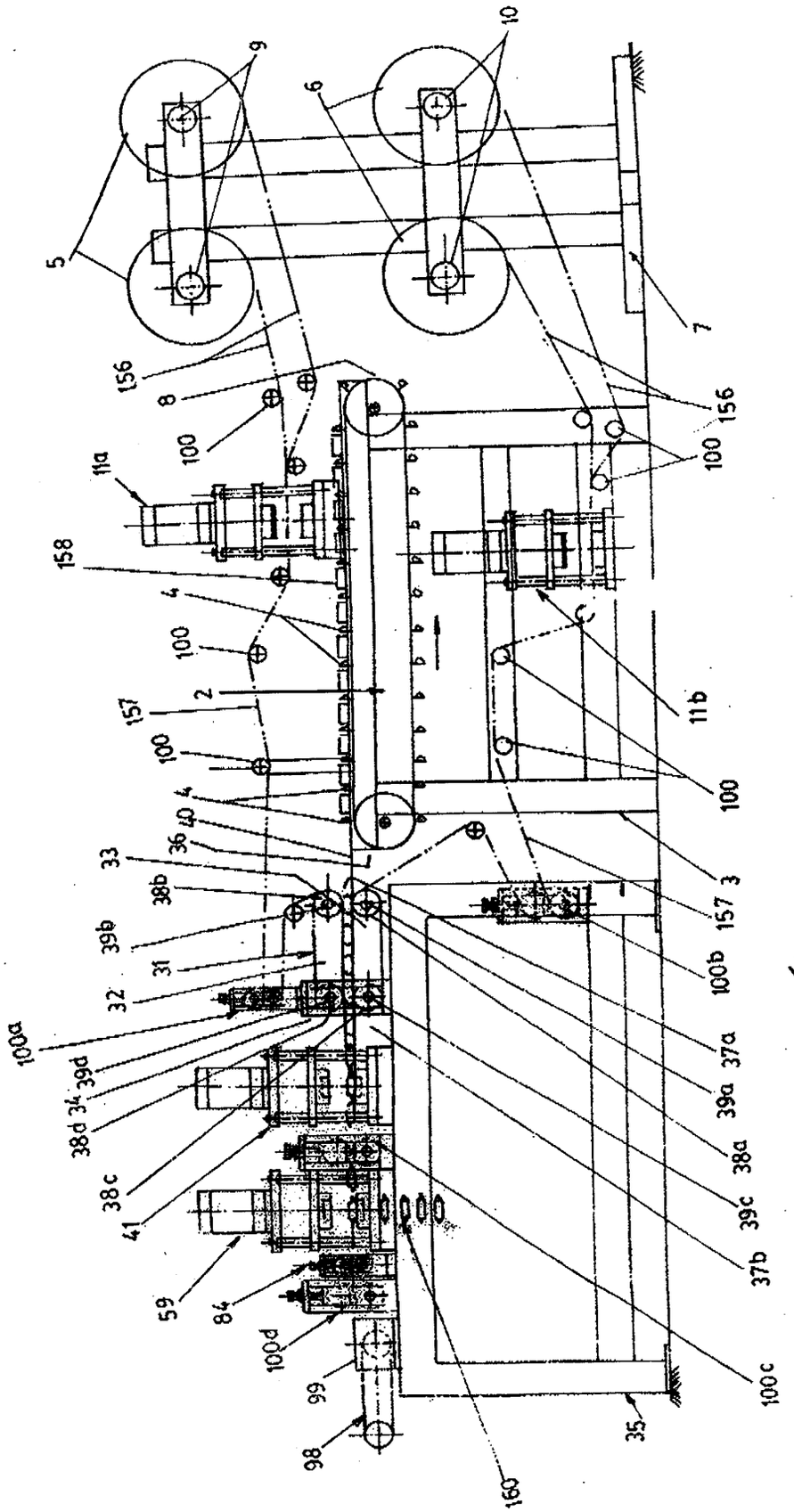

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7
156
8
100
11a
158
4
2
157
3
11b
33
36
40
38b
39b
31
32
100a
39d
34
38d
38c
41
59
84
100d
99
98
160
35
100c
37b
39c
38a
39a
37a
100b

FIG 1

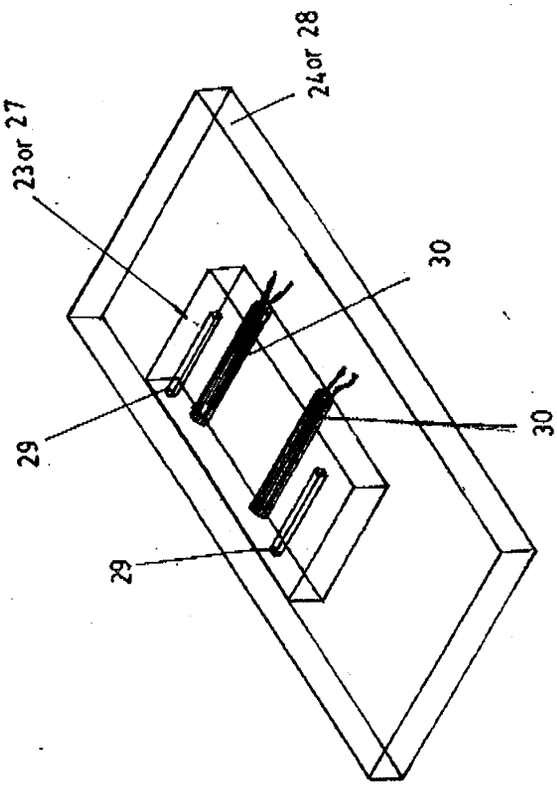

23or 27
24or 28
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FIG 3

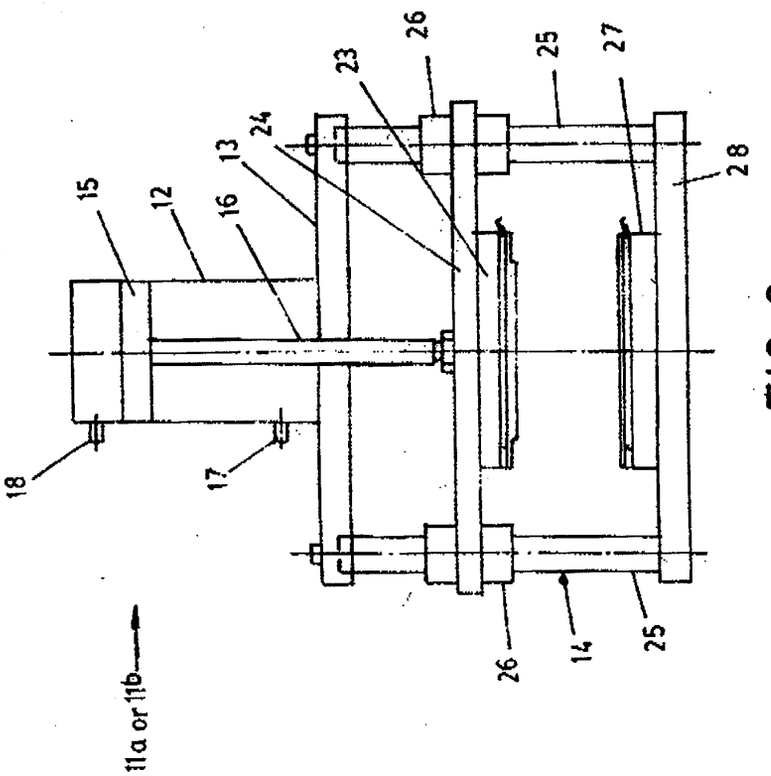

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12
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17
11a or 11b
26
14
25

FIG 2

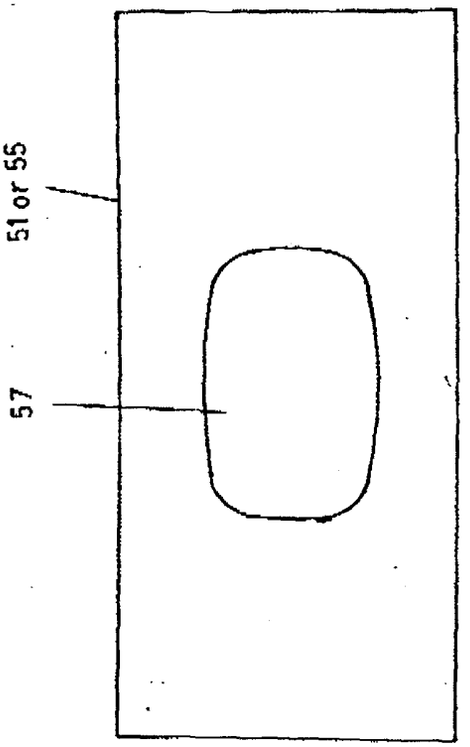


FIG 5

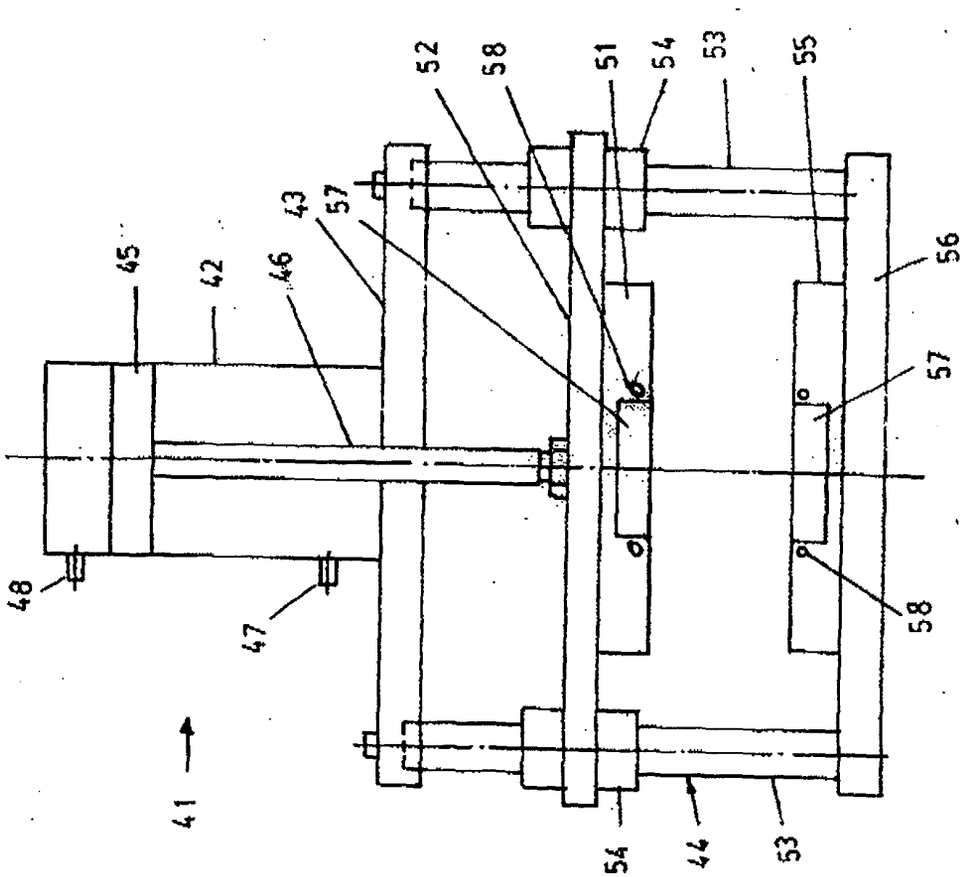


FIG 4

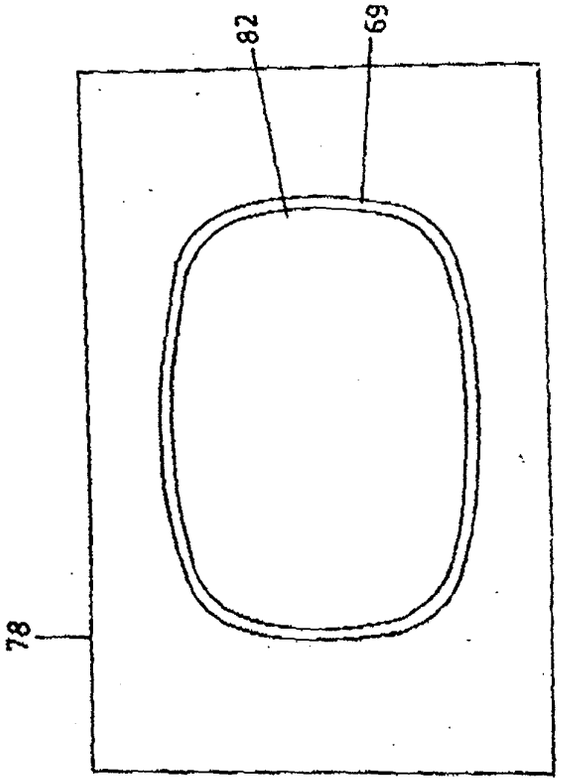


FIG 7

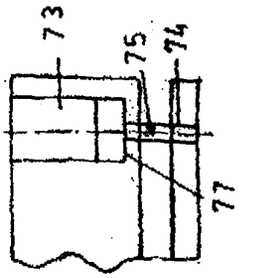


FIG 8

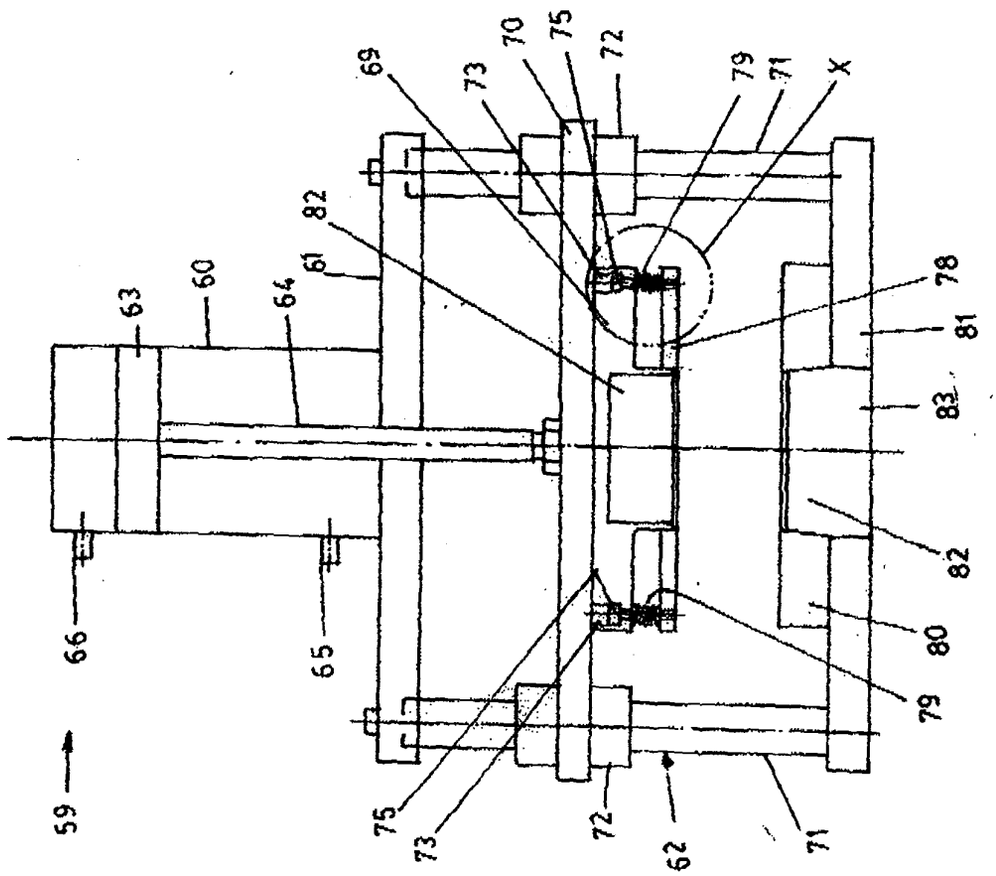


FIG 6

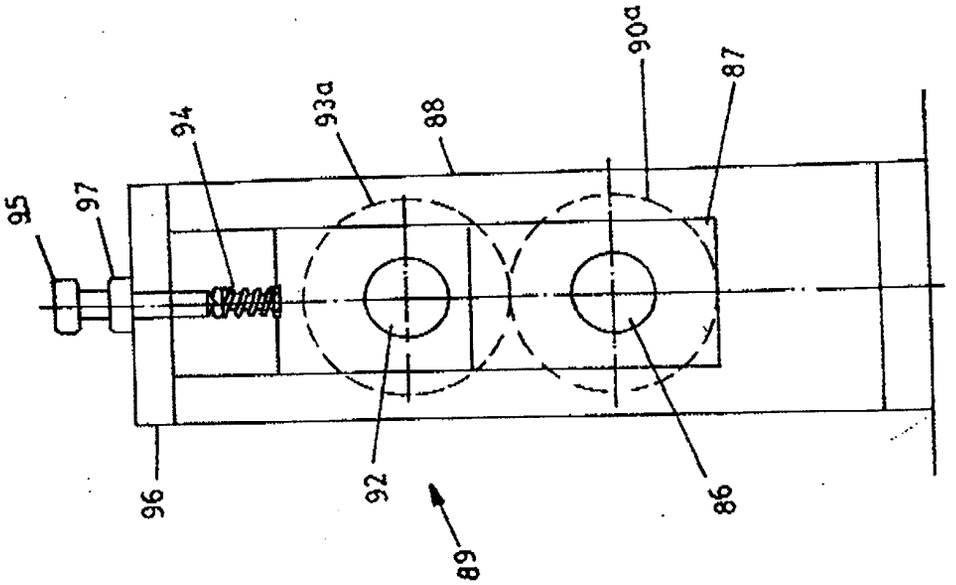

90a
87
94
93a
88
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96
92
86
89

FIG 10

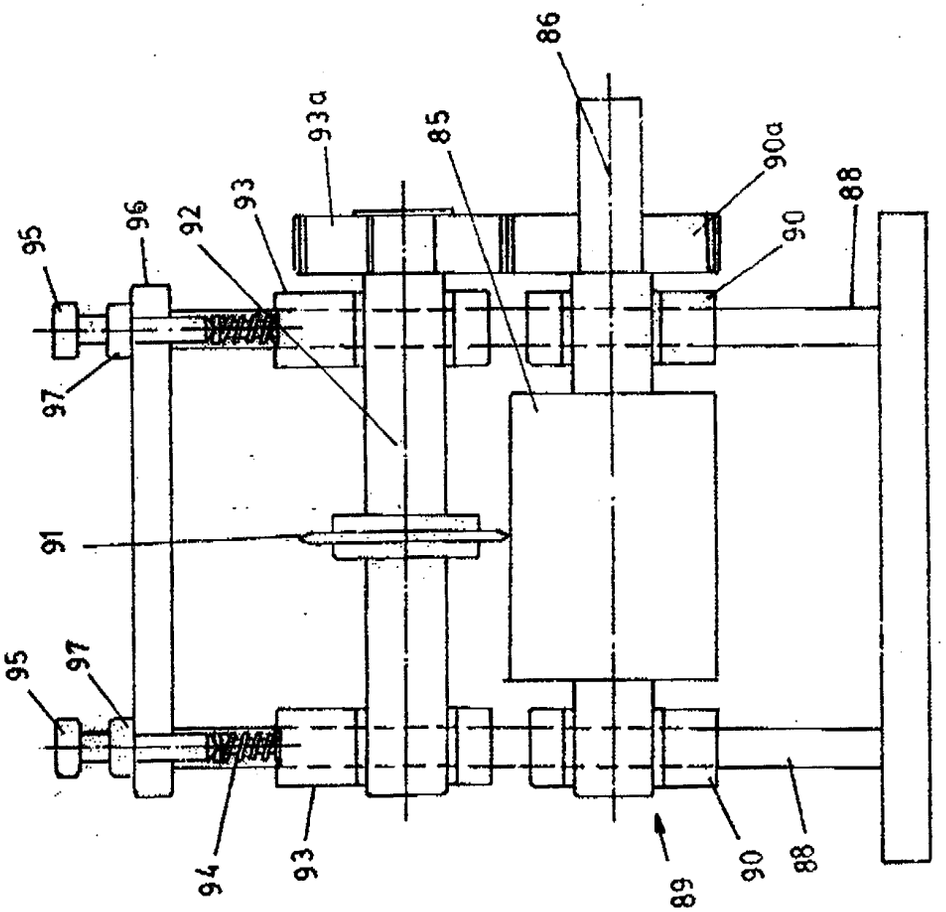

86
93a
85
90a
88
93
96
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90
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FIG 9

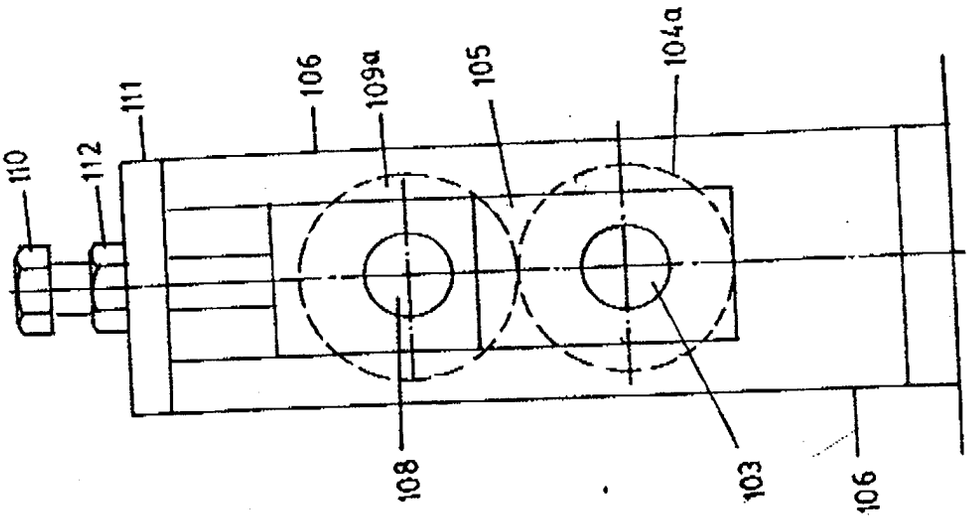

110
112
111
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109a
105
104a
108
103
106

FIG 12

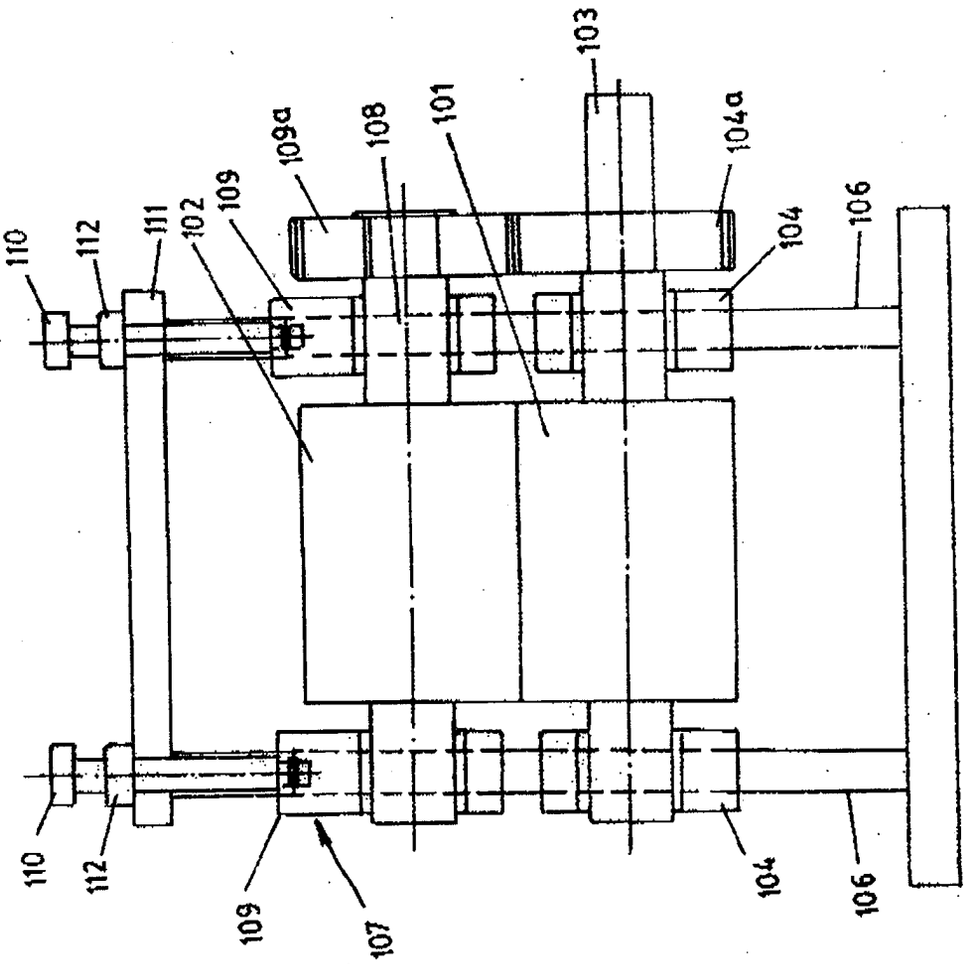

103
109a
108
101
104a
110
112
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102
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107
104
106

FIG 11

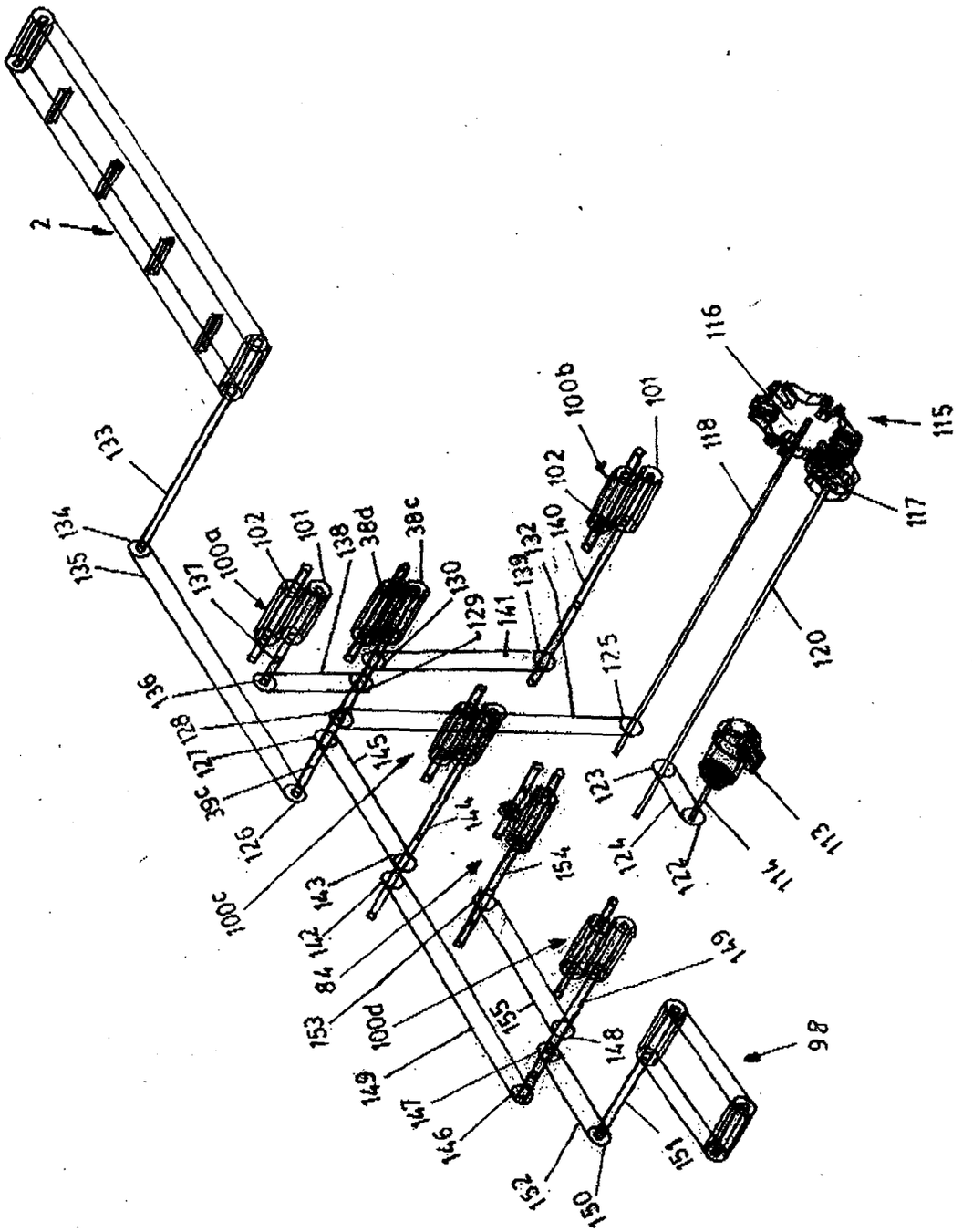

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133
134
135
137
100a
102
101
138
38d
38c
130
129
141
139
132
140
102
100b
101
116
118
115
117
120
125
136
128
127
39c
129
145
100c
143
142
84
153
100d
155
149
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151
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154
144
123
124
122
114
113

FIG 13

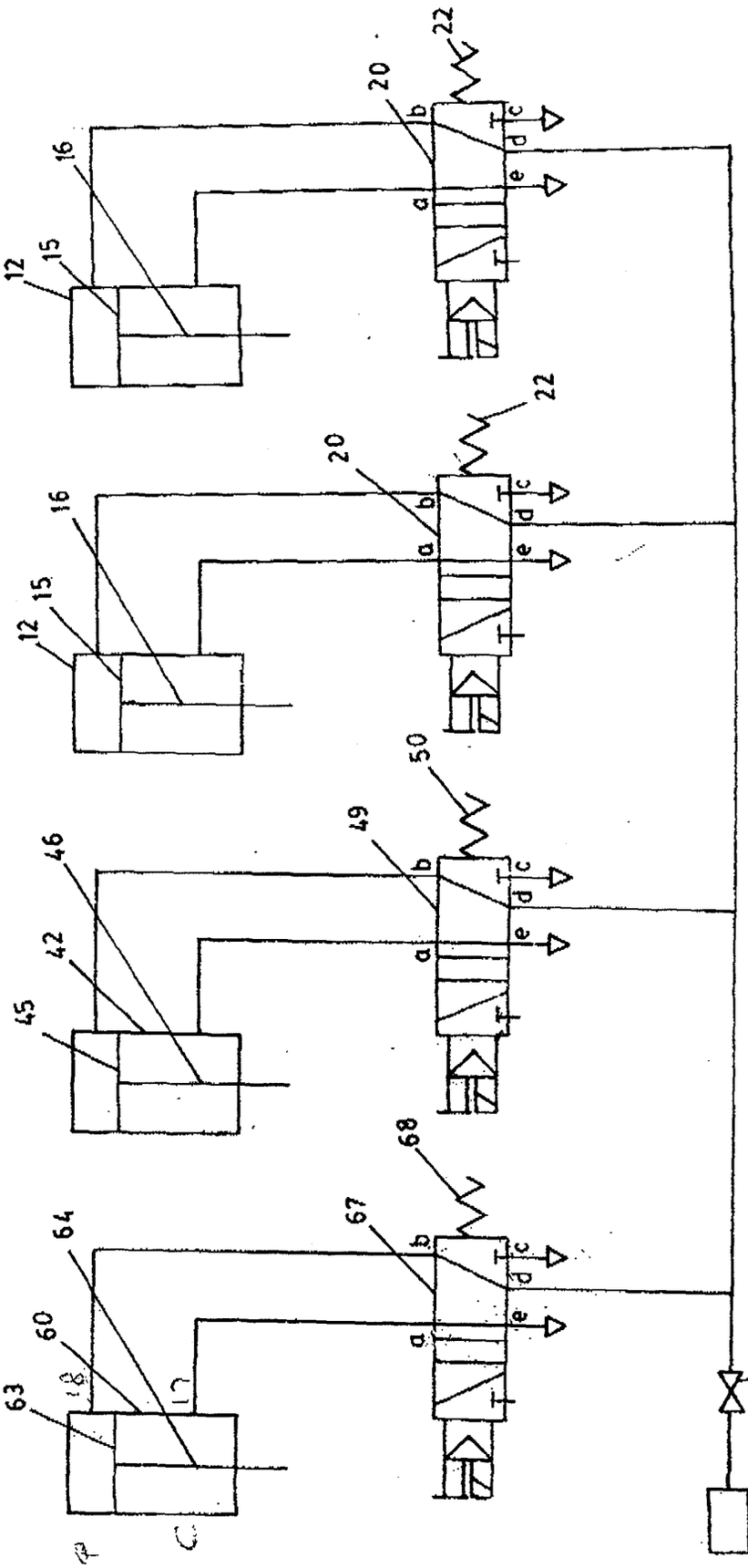


FIG 14

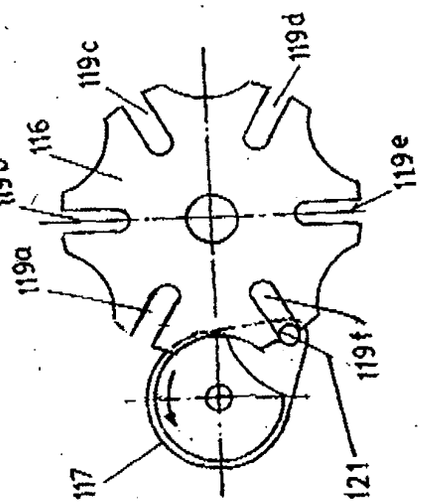


FIG 17

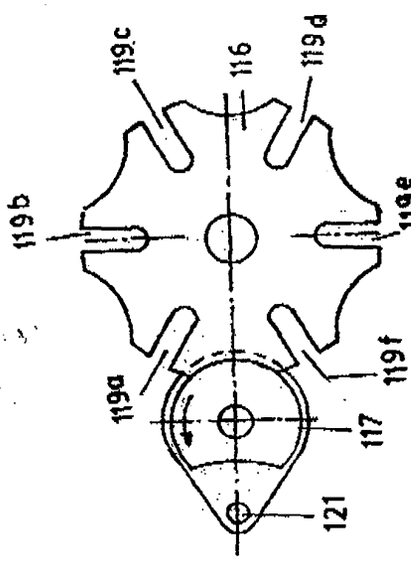


FIG 16

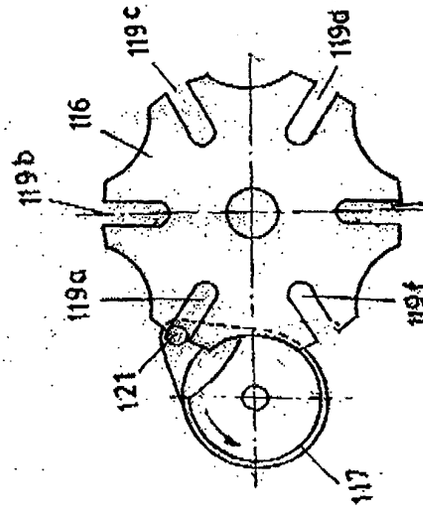


FIG 15

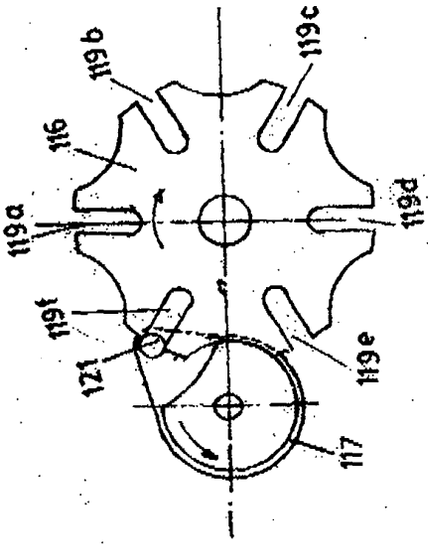


FIG 19

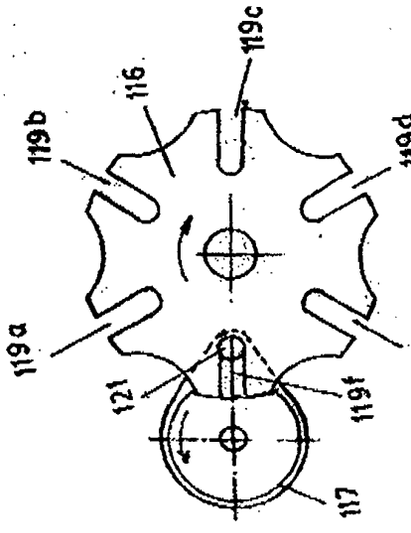


FIG 18

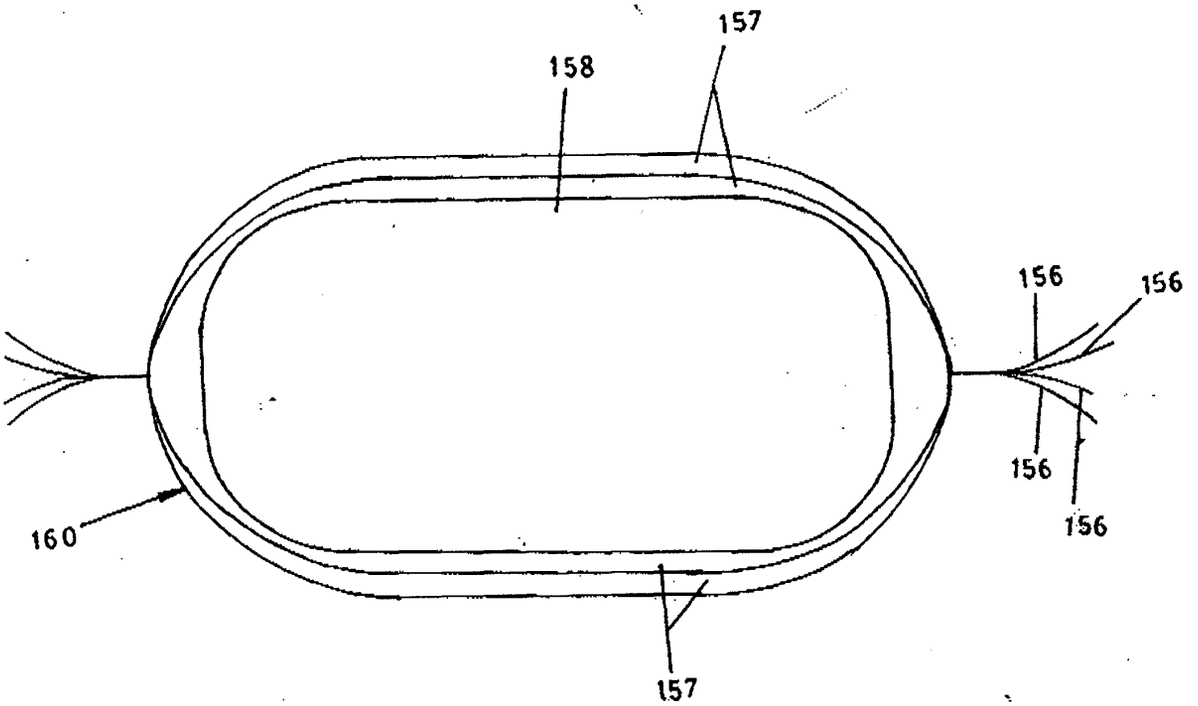


FIG 20

European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 03 25 2840

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.7)
A	US 2002/025215 A1 (DUDEN CAROL ET AL) 28 February 2002 (2002-02-28) * page 3, paragraph 40 - paragraph 41; claims 27-30; figure 1 *	1-10	B65B9/02 B65B35/24 B65B41/16 B65B51/26 B65B61/06
A	US 3 527 633 A (BERTOGLIO GUIDO D) 8 September 1970 (1970-09-08) * column 1, line 16 - line 46; figures 1,4-6 *	1-10	B65B65/04
A	GB 870 692 A (HAMAC A G) 14 June 1961 (1961-06-14) * figure 7 *	1-10	
A	US 5 524 419 A (SHANNON JOHN H) 11 June 1996 (1996-06-11) * figures 1,6,7 *	1-10	
A	DE 501 681 C (ALFRED GERMAN ROSE;ROSE BROTHERS GAINSBOROUGH LMT) 8 July 1930 (1930-07-08) * figure 3 *	10	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65B

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

1-10

Claims searched incompletely :

Claims not searched :

11

Reason for the limitation of the search:

The definition of the subject-matter of claim 11 relies on reference to the drawings (Rule 29 (6) EPC).

Place of search	Date of completion of the search	Examiner
MUNICH	8 August 2003	Damiani, A

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D : document cited in the application
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08-08-2003

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