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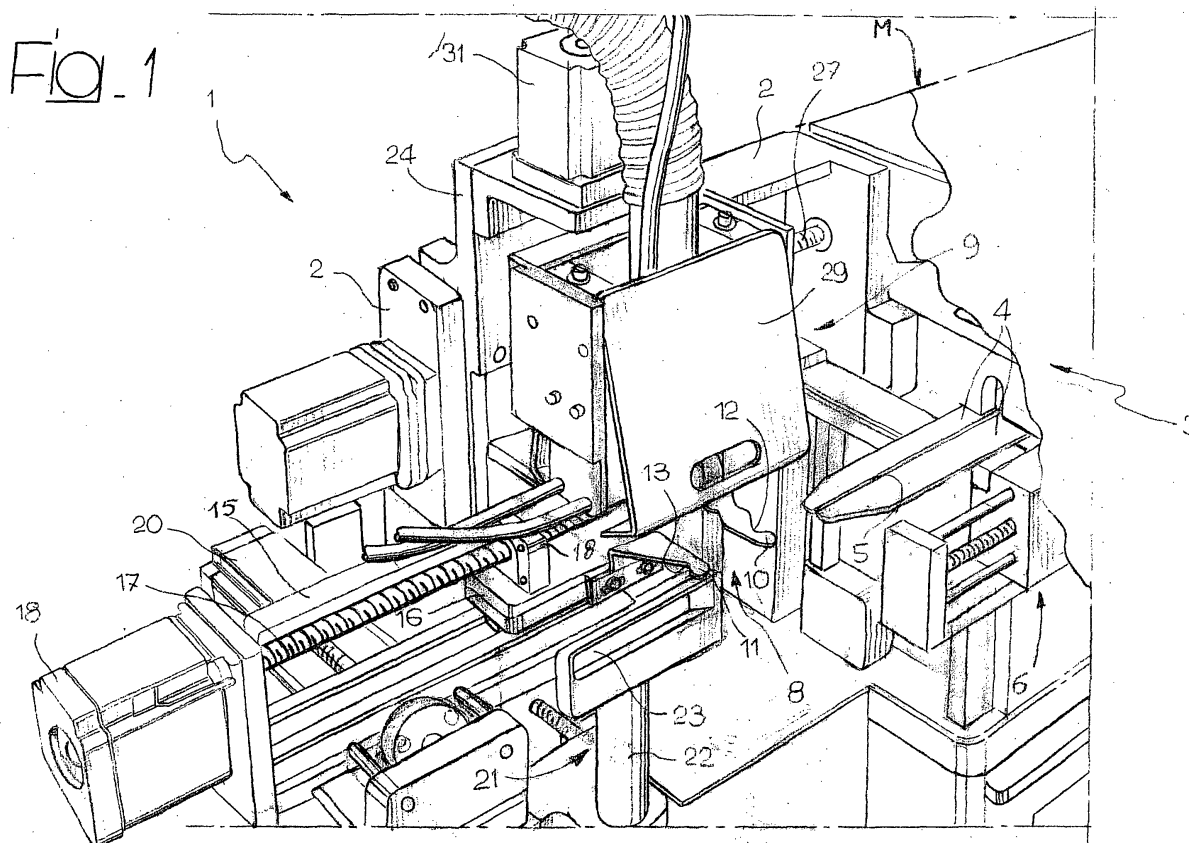
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(54) Method and device for loading stockings on the conveyor of a sewing machine

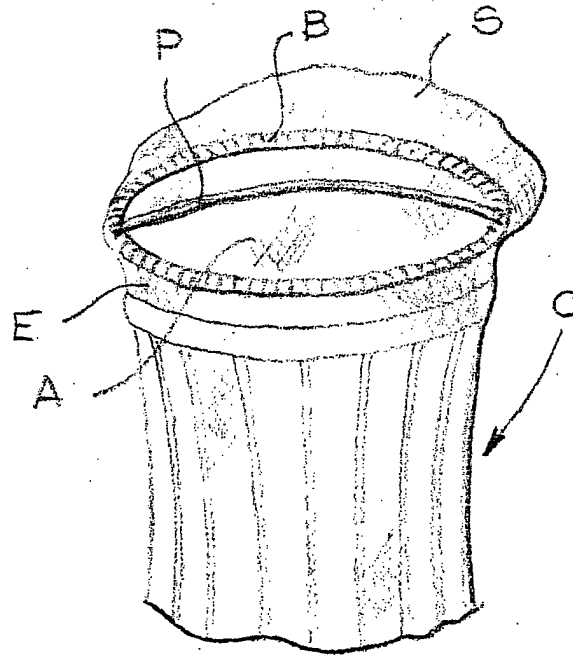
(57) The loading of a stocking (C) with open tip (A) on the conveyor assembly (3) of a sewing machine is achieved in mechanised fashion, preliminarily forming

a thread bridge (P) through the open end (A) of the stocking (C). The thread bridge (P) is then used with a loading device (1) including a first and a second motorised grip assemblies (8, 9).



EP 1 464 748 A2

Fig. 15



Description

TEXT OF THE DESCRIPTION

[0001] The present invention relates, in general, to the production of stockings on circular stocking machines.

[0002] As is well known, once weaving on the circular machine is completed each stocking, with its tip open, is transferred to an accumulation container and thence to a sewing machine for the sewing of the tip. The sewing machine is traditionally provided with a conveyor assembly including a pair of horizontal bars which delimit a longitudinal guiding slit for the insertion of the open tip of the stocking after it has preventively been flattened at the tapers of the tip.

[0003] These operations are normally performed manually by qualified personnel, which entails high production costs and operating rhythms which necessarily depend on the manual ability of the personnel employed.

[0004] The object of the present invention is to provide a method and a device which allow to make at least semi-automated the operations of loading the stockings onto the conveyor of the sewing machine, thereby speeding up said operation, freeing it from the limits connected to the manual operations heretofore required.

[0005] According to the invention, said object is achieved thanks to a method for loading a stocking onto the conveyor of a sewing machine, whose primary characteristic is that it entails a preliminary operation of preparing the open tip of the stocking, consisting of forming a thread bridge joined at its end at two opposite areas of the open tip of the stocking corresponding to the end of the related tapers and extending through said open tip for a length that is substantially equal to the width of the tip when the tip is flattened.

[0006] As shall be readily apparent in the description that follows, the aforesaid thread bridge, which according to the invention is conveniently made by the circular stocking machine in the final phase of manufacture of the open tip of the stocking, allows to manipulate in mechanical fashion, i.e. with no need for manual intervention, the stocking during its loading onto the conveyor of the sewing machine.

[0007] For the preparation of the thread bridge by the circular stocking machine, a method of preparation can be used whose initial phase can correspond to what is described and illustrated in the European patent EP-B-0576664 by the same Applicant. According to said method the manufacture of the open tip of the stocking entails, at the end of the tapering of the tip, forming a complete rank with the same yarn as the stocking but woven with thicker stitches and reinforced with the addition of a second thread, forming another complete rank with the same yarn as the stocking but woven with loose stitches, forming a series of ranks made of elastic yarn with finer count than the one used for the stocking, and then forming a series of ranks, reinforced by insert-

ing larger threads than the one used for the stocking.

[0008] The length of the thread bridge thus formed will be equal to the width of the tip of the stocking when, in the flattened condition thereof, both are put under tension.

[0009] The thread bridge thus obtained is, as stated, advantageously used, according to the invention, for the mechanised loading of the stocking onto the conveyor assembly of the rectilinear sewing machine with the aid of a loading device which, according to the invention, comprises:

- a first grip assembly bearing a pair of suspension hooks, movable between a mutually approached position for introducing the aforesaid thread bridge of the stocking and a mutually spaced apart position for tensioning said bridge and consequently flattening the open tip of the stocking suspended between them,
- a second grip assembly comprising a pair of jaws movable between a raised open position and a lowered closed position, said second grip assembly being displaceable between a waiting condition in which said two jaws are situated in the raised open position above said first grip assembly, and a gripping condition in which said two jaws are in lowered closed position to grip therebetween the tip of the stocking tensioned and flattened between said two hooks of the first grip assembly,
- motorised actuator means to simultaneously displace said first and second grip assembly starting from said gripping condition of the two jaws of the second grip assembly towards a position of introduction of said tip of the stocking between said pair of horizontal bars of the conveyor of the sewing machine so as to introduce into said guiding slit,
- motorised actuator means to command said first grip assembly and of said second grip assembly according to a sequential operating cycle.

[0010] In a preferred embodiment of the loading device according to the invention, to the first grip assembly is operatively associated an upper aspirating device, and to the second grip assembly are operatively associated a device for blowing pressurised air and a lower aspiration device. The features and the advantages of the present invention shall become readily apparent from the detailed description that follows, provided purely by way of non limiting example, with reference to the accompanying drawings, in which:

- Figure 1 is a perspective schematic view of a loading device according to the invention,
- Figure 2 is a perspective view of the device from another angle,
- Figure 3 is a perspective view of the device from another angle,
- Figure 4 is a schematic front elevation view in re-

duced scale of the device shown in a first step of the loading cycle,

- Figure 5 is similar view to Figure 4, showing a second step of the loading cycle,
- Figures 6, 7 and 8 are similar views to Figure 4, showing the subsequent steps of the loading cycle,
- Figure 9 is a top plan and simplified view of Figure 4,
- Figure 10 is a top plan and simplified view of Figure 5,
- Figure 11 is a simplified top plan view of Figure 7,
- Figure 12 is similar view to Figure 11, showing a second step of the loading cycle,
- Figure 13 is a simplified top plan view of Figure 8,
- Figure 14 is a schematic perspective view showing the open tip of a stocking prepared, according to the invention, in such a way that it can be loaded by the device according to Figures 1 through 13,
- Figure 15 is similar view to Figure 14, showing a second step of the loading cycle;
- Figure 16 is similar view to Figures 14 and 15, with the open tip of the stocking fully flattened and under tension,
- Figure 17 is an enlarged photographic reproduction of the open tip of the stocking, similar to Figure 15, showing the details of its preparation, and
- Figure 18 shows a part of Figure 3 in enlarged scale.

[0011] Referring initially to Figures 1 through 3, the number 1 globally designates a device for the mechanised loading of open tip stockings produced on one or more circular machines for stockings and destined to be transferred to a sewing machine for the sewing of the open tips of the stockings.

[0012] An example of such a stocking is schematically shown in Figures 14 through 17: the stocking, generically designated as C, is formed in correspondence with its open tip A with a thread bridge or cross member P which extends through said open tip A in correspondence with the end of the related tapers and has a length that is substantially equal to the width of the open tip A in its flattened condition shown in Figure 16, when a traction is applied in correspondence with the opposite ends of the bridge P.

[0013] The method whereby the bridge P is obtained shall be described farther on.

[0014] As shown in Figures 14 and 15, on a side of the open tip A the sock C has a pouch S, to be described in greater detail hereafter. The (reinforced) edge of the open tip A is designated as B in these figures.

[0015] Returning now to Figures 1 through 3, the device 1 according to the invention essentially comprises a support structure 2 which is coupled to a sewing machine, generically designated by the reference M and of a generally conventional type for the sewing of the open tips A of the stockings C. For the purposes of the present invention it is sufficient to clarify that the sewing machine (for instance, but not necessarily, rectilinear) includes a conveyor assembly generically designated by the refer-

ence 3, also generally conventional and for example of the type described and illustrated in the Italian Patent IT-B-1288456 by the same Applicant. Said conveyor assembly includes a pair of horizontal bars 4 which delimit between them a longitudinal guide slit 5 for the insertion of the open tip A (in the flattened and tensioned configuration shown in Figure 16) of each stocking C loaded by the device 1 on the conveyor assembly 3.

[0016] Said conveyor assembly 3 is also equipped with a pincer-like motorised transfer device, schematically designated by the reference 6 in Figures 7 through 8 and 11 through 13, movable below the two horizontal bars 5 to grip the stocking C introduced into the longitudinal guide slit 5 and transfer it until it is secured to a chain conveyor 7 visible in Figures 7, 8, 12 and 13, which sends the stocking C to the sewing area of the sewing machine.

[0017] The support structure 2 of the device 1 sustains a first grip assembly, generically designated by the reference number 8 and a second grip assembly generically designated by the reference number 9, whose conformation shall now be described in detail with reference to the embodiment of Figures 1 through 3.

[0018] The first grip assembly 8 includes a pair of horizontal suspensions hooks 10, 11 formed with respective recesses 12, 13 normally aligned with the guide slit 5 of the conveyor assembly 3. The hook 10 closer to said conveyor assembly 3 is fastened in overhang to a support 14, more clearly visible in Figure 2, which in turn is integral with a body 15. The other hook 11 is borne by a cursor 16 mounted horizontal slidable along the body 15 between a proximal position and a distal position relative to the hook 10. The displacement of the hook 11 between said proximal and distal positions is actuated by a worm screw 17 driven by a stepped motor 18 and engaged in a nut screw 19 integral to the cursor 16.

[0019] The body 15 is also movable horizontally, in an orthogonal direction to the direction of displacement of the movable hook 11, between an advanced position in which the recesses 12, 13 of the two hooks 10, 11 are, as stated, aligned with the guide slit 5 of the conveyor assembly 3, and a rear position in which the hooks 10 and 11 are slightly displaced in the direction of the support 2. Said displacement is actuated by means of a stepped motor 20, which also actuates for example a screw and nut screw system.

[0020] The arrangement can also be such as to move the body 15, and hence hooks 10 and 11, towards a position yet more advanced than the advanced position described above, for the purpose of making easier and safe the operations of hooking the stocking which shall be described farther on.

[0021] The first grip assembly 8 also includes a lower aspirating device 21 formed by a tubular upright 22 bearing a front inlet 23 and connected to a suction source. The lower aspirating device 21 is movable vertically, by means of a fluid cylinder 40, between a raised position and a lowered position (shown with solid line in Figure

3 and in Figures 4 and 5 and 18), and movable horizontally between an advanced position (shown in Figure 3 with solid line) and a rear position (shown in Figure 3 with dashed line) by means of a fluid cylinder not shown, but known by those versed in the art.

[0022] The second grip assembly 9 comprises a body 24 movable horizontally along guides 25 of the support 2 by means of a system with nut screw 26 and screw 27 actuated in rotation by means of a stepped motor 28. The body 24, which bears the entire first grip assembly 8 described above, bears a pair of jaws 29 positioned above the hooks 10, 11 of the first grip assembly and movable between a mutually distanced open position (shown in Figures 1, 2 and with dashed line in Figures 3 and 18) and a mutually approached closed position (shown with solid line in Figures 3 and 18) by means of a fluid cylinder 30.

[0023] In the case of the illustrated example, the displacement of the two jaws 29 between the open and closed position consists of an oscillation: in a variant, not illustrated herein, said displacement could consist of a mutual translation of the two jaws 29.

[0024] The two jaws 29 are also displaceable, by means of a stepped motor 31 and an assembly with screw 36 and nut screw 37, between a raised waiting condition (shown with dashed line in Figure 3 and in Figures 4 and 5) in which they are positioned distally relative to the hooks 10 and 11, and a lowered position, proximal to said hooks 10, 11 of the first grip assembly 8, in the manner illustrated with solid line in Figure 3 and in Figures 6, 7 and 18.

[0025] To the second grip assembly is operatively associated a blowing device including a pair of holed manifolds 32 connected to a source of pressurised air to direct respective air jets downwards, or towards the hooks 10, 11 of the first grip assembly 8.

[0026] Moreover, to the second grip assembly 9 is operatively associated an upper aspirating device including an elongated conduit 33 interposed between the manifolds 32 of the blowing device and connected to a source of vacuum.

[0027] The blowing device 32 and the upper aspirating device 33 of the second grip assembly 9, as well as the aspirating device 21 of the first grip assembly 8 are shown summarily in Figure 3, whilst the respective sources of pressurised air and of suction are not shown for the sake of simplicity of illustration and because they are wholly conventional. The function of the devices 21, 32 and 33 shall be clarified hereafter.

[0028] The motorised actuators described previously in relation to the first and to the second grip assembly 8, 9 are operatively connected to an electronic control unit whereby they are operated in synchronised fashion according to an operative cycle which shall now be described below with particular reference to Figures 4 and 13.

[0029] Let it be supposed that in the initial condition the body 24 bearing the first and the second grip assem-

bly 8, 9 is positioned on the support 2 side by side with the horizontal bars 4 of the conveyor assembly 3. In this initial condition, the hook 11 of the first grip assembly 8 is positioned in the proximal position with respect to the other hook 10 and both are in the advanced position in which the respective recesses 12, 13 are aligned horizontally with the guide slit 5 of the conveyor assembly 3. In fact the hooks 10 and 11 may be preliminarily positioned, as explained previously, in a yet more advanced position.

[0030] The lower aspirating device 21 is inactive and in raised and rear position.

[0031] As to the second grip assembly 9, the jaws 29 are in a raised and open position, and both the blowing device 32 and the upper intake device 33 are inoperative.

[0032] In this position, a stocking C with its thread bridge P formed through its open tip A is picked up from an accumulation container and transferred to the loading device, positioning the bridge P astride the hooks 10, 11 in correspondence with the related recesses 12, 13.

[0033] This operation of positioning the stocking C on the first grip assembly 8 of the loading device 1 can be performed manually in extremely simple and rapid fashion by an operator or, alternatively, in automated fashion.

[0034] The stocking C thus remains loosely suspended by its bridge P engaged in the recesses 12 and 13 of the hooks 10 and 11, as shown in Figures 4 and 9.

[0035] If the two hooks 10 and 11 had been placed in the yet more advanced position, at this point they are brought to the advanced position in which the respective recesses 12, 13 are aligned horizontally with the guide slit 5 of the conveyor assembly 3.

[0036] The subsequent phase, shown in Figures 5 and 10, consists of moving the hook 11 to its distal position relative to the hook 10, by means of the screw 17 and nut screw 19 system and the stepped motor 18. At the end of this phase, represented in Figures 5 and 17, the bridge P is under traction: since in this condition its length is, as explained above, substantially equal to the width of the opening A of the tip of the stocking C, said tip is also under tension in a flattened condition corresponding to the one shown in Figure 16, with its pouch S positioned dorsally in soft condition.

[0037] At this point the activation is commanded of the blowing device 32 of the second grip assembly 9, whilst simultaneously the jaws 29 kept open are displaced, by means of the motorised actuator 31, from the raised position to the lowered position, in the manner shown in Figure 6. The jets of pressurised air generated by the blowing device 32 in this phase effect the lowering of the pouch S of the open tip A of the stocking C, in such a way as to move it away and downwards relative to the operating area of the second grip assembly 9.

[0038] Then, as soon as the jaws 29 reach the lowered position, the activation is commanded of the upper

aspirating device 33 which, acting on the edge B of the open tip A, aligns it horizontally against the lower side of the grip assembly 9.

[0039] The subsequent phase entails the closing of the jaws 29, by means of the fluid actuator 30, in such a way as to grip between them the edge B thus aligned by the upper aspirating device 33, in the manner shown in Figure 6 and also in Figure 18.

[0040] At the end of this phase, through the fluid actuator 20, the lower aspirating device 12 of the first grip assembly 8 is commanded to approach the dorsal area of the stocking C situated below the hooks 10, 11, and it is activated. The inlet 23 of the lower intake device 21 is then moved downwards, by means of the fluid actuator 40, in such a way as to tension the elasticised ranks (designated with the reference R3 in Figure 17, whereon the description shall return farther on) of the stocking C situated immediately below the edge B held by the jaws 29. This phase is also shown in Figure 6 and in Figure 18.

[0041] Then, with the stocking kept in traction downwards by the lower aspirating device 21 whilst its edge B is gripped between the jaws 29 with the bridge P kept under tension between the hooks 10 and 11, the body 24 bearing the two grip assemblies 8, 9 is translated in the direction of the conveyor assembly 3 of the sewing machine sliding along the guides 25 of the support 2 by the operation of the stepped motor 28 and the system with nut screw 26 and screw 27. Since, as stated previously, the recesses 12 and 13 of the hooks 10, 11 of the first grip assembly 8 are aligned with the guide slit 5 defined between the horizontal bars 4 of the conveyor assembly 3, the area of the stocking C situated immediately below the edge B gripped between the jaws 29 of the second grip assembly 9 is inserted in said guide slit 5, in the manner shown in Figures 7 and 11.

[0042] As a result of the introduction of the entire width of the stocking C between the bars 5, the fluid actuator 30 commands the opening of the jaws 29 and the actuator 31 commands the subsequent rise of the second grip assembly 9, thereby freeing the edge B positioned above the bars 4. Simultaneously, the lower aspirating device 21 of the first grip assembly 8 is deactivated and brought back to the rearwards and raised starting position.

[0043] The hook 11 of the first grip assembly 8 is then moved to the proximal position towards the other hook 10, by means of the motorised actuator 18 and the screw and nut screw 17, 19 system and then the entire first grip assembly 8 is moved to the rearwards position by means of the motorised actuator 20, to free the bridge P of the stocking C. This step is shown in Figure 12.

[0044] The gripping device 6 of the conveyor assembly 3 is then activated and grips on the opposite sides the stocking C immediately below the horizontal bars 4, in the manner shown in Figure 7.

[0045] The body 24 bearing the first and the second grip assembly 8, 9 is then translated to the starting po-

sition, to repeat the loading cycle of the next stocking, whilst the stocking C thus inserted between the horizontal bars 4 of the conveyor assembly 3 is translated along the guide slit 5 by the gripping device 6 until it is grabbed by the chains 7, in the manner shown in Figure 13.

[0046] The stocking C is thus sent to the sewing machine for the sewing of the tip A.

[0047] The method for preparing the stocking C to make it suitable for use with the loading device 1 described above shall now be described below, with particular reference to Figure 15A.

[0048] Very briefly, said method consists of forming the thread bridge P joined at its ends to two opposite areas of the open tip A of the stocking C which correspond to the end of the tapers of the tip itself, as stated for a length that is substantially equal to the width of the tip A when said tip A is flattened and tensioned.

[0049] According to the invention, the method for preparing the stocking C comprises a series of preliminary operations which are generally known in themselves, for example similar to those described in European Patent EP-B-057664 by the same Applicant.

[0050] Briefly, the stocking is woven on an electronic circular machine with needle selection. By way of example, one can consider the preparation on a circular machine for stockings with diameter 3-3/4" with 144 needles.

[0051] After weaving the stocking in the usual manner until the end of the tapers of the tip, a complete rank R1 is executed with the same yarn as the stocking, but woven with thicker stitches and reinforced with the addition of a second thread. Another complete rank R2 is then executed with the same thread used for the stocking, but woven with loose stitches. The reinforced rank R1 and the loose rank R2 start and end in correspondence with the end of one of the tapers of the tip of the stocking.

[0052] A thread change is then completed and a certain number (for example five) of ranks R3 is executed with elastic yarn having a finer count than the one used for the stocking (40/2 DEN).

[0053] The height of said fine ranks, including the loose rank, measured with the fabric tensioned will be, for example, in the order of 7-8 mm.

[0054] After completing the fine ranks R3, a new thread change is carried out and a certain number (for example, eight) of reinforced ranks R4 are executed, inserting larger threads than the one used for the body of the stocking.

[0055] Whilst the first drop of the circular machine continues to execute the reinforced stitching, the second drop of the machine intervenes and, selecting the needles in the stitch one by one, executes two complete ranks R5 for example with a polyester thread with count 200/8 DEN, and then selects ten needles before the first vertex of the heel and ten needles subsequent to the second vertex of the heel, thereby creating the thread bridge P between the two vertices.

[0056] The system then continues on the first drop in

order to execute a certain number (for example eighteen) of additional reinforced ranks R6 which complete the edge B of the open tip A of the stocking C.

[0057] At the end the stocking C is in the manner shown in Figures 14 through 16, with the reinforced edge B where to is connected the thread bridge P, and below which is positioned the elastic portion formed by the fine ranks R3, designated by the reference E in said figures. This elastic portion E, when the stocking C - tensioned downwards by the action of the lower aspirating device 21 - is transferred from the grip assemblies 8 and 9 of the loading device 1 towards the conveyor assembly 3, allows a precise insertion along the guide slit 5.

[0058] As has been clarified several times already, it is important that the length of the bridge P be equal to the width of the open tip A of the stocking C in the flattened condition, and when both (tip A and bridge P) are tensioned, in the manner shown in Figure 16.

[0059] To obtain the length of the bridge P equal to the tensioned tip A of the stocking C, it will be necessary to act on the tension of the stitching of the reinforced edge B. Thus, if the bridge P is, for some reason, shorter than the width of the flattened open tip A of the stocking C, it may be elongated to the necessary measure by intervening on the second drop of the circular stocking machine and then unloading the two plus two needles that will form the bridge P. Two needles at about 10-15 mm after the first taper and two needles at about 10-15 mm after the second taper will in this case rise on the second drop to unload the reinforced stitches. At the following turn, on the second drop will start working the thread guide of the bridge P and the same pairs of needles unloaded from the old stitch will rise to take the tread. Once the thread of the bridge P is unloaded, the system will rise on the first drop, at first with one of the two needles for each pair, and then with the other one to conclude the reinforced stitch ranks R6 of the edge B.

[0060] Naturally, the construction details and the embodiments of the loading device according to the invention may vary widely from what is described and illustrated herein, without thereby departing from the scope of the present invention as defined in the claims that follow. Thus, for instance, all motorised actuators and related transmission systems described with reference to the illustrated example may be replaced with different and functionally equivalent devices.

[0061] Thus, for instance, the thread bridge P may be formed by multiple threads.

[0062] Moreover, the device may be equipped with a shear cutting assembly for the separation of the thread bridge P from the tip A of the stocking C after it has been inserted in the guide slit 5 of the conveyor assembly 3. This would have the purpose of simplifying the release of the stocking C by the hooks 10 and 11.

Claims

1. A method for preparing a stocking (C) with open tip (A) produced on a circular stocking machine, **characterised in that** it consists of forming a thread bridge (P) joined at its ends to two opposite areas of the tip (A) of the stocking (C) corresponding to the end of the related tapers and extending through said open tip (A) for a length that is substantially equal to the width of the open tip (A) when said tip is in a flattened condition.
2. A method as claimed in claim 2, **characterised in that** said thread bridge (P) is obtained by the circular stocking machine during the formation of the open tip (A) of the stocking (C).
3. A method as claimed in claim 2, in which the formation of the open tip (A) of the stocking (C) entails, at the end of the tapers of the tip, forming another complete rank (R1) with the same yarn as the stocking but woven with thicker stitches and reinforced with the addition of a second thread, forming another complete rank (R2) with the same yarn as the stocking but woven with loose stitches, forming a series of ranks made of elastic yarn (R3) with finer count than the one used for the stocking, and then forming a series of ranks (R4), reinforced by inserting larger threads than the one used for the stocking (C), **characterised in that** said thread bridge (P) is obtained as a result of the formation of said reinforced ranks (R4), and then an additional series of reinforced ranks (R5, R6) is obtained, completing the edge (B) of the open end (A) of the stocking (C).
4. A method as claimed in any of the claims from 1 through 3, **characterised in that** the length of said thread bridge (P) is equal to the width of the open tip (A) of the stocking when, in the flattened condition thereof, both are put under tension.
5. A stocking, **characterised in that** it is obtained in accordance with the method as claimed in one or more of the claims 1 through 4.
6. A stocking as claimed in claim 5, **characterised in that** said thread bridge (P) is used for loading the stocking (C) onto a motorised conveyor assembly (3) of a sewing machine for sewing said tip (A) of the stocking (C).
7. A device for loading a stocking (C) as claimed in claim 5 on a conveyor assembly (3) of a sewing machine for sewing the open tip (A) of the stocking (C), in which said conveyor assembly (3) includes a pair of horizontal bars (4) which delimit a longitudinal guide slit (5) for the insertion of the open tip (A) of the stocking (C), in a flattened condition of said

open tip (A), **characterised in that** it comprises:

- a first grip assembly (8) bearing a pair of suspension hooks (10, 11) movable between a mutually approached position for introducing the aforesaid thread bridge (P) of the stocking (C) and a mutually spaced apart position for tensioning said bridge (P) and consequently flattening the open tip (A) of the stocking (C) suspended between them, 5
- a second grip assembly (9) comprising a pair of jaws (29) displaceable between a raised open position and a lowered closed position, said second grip assembly (9) being displaceable between a waiting condition in which said two jaws (29) are situated in raised open position above said first grip assembly (8), and a gripping condition in which said two jaws (29) are in lowered closed position to grip therebetween the open tip (A) of the stocking tensioned between said two hooks (10, 11) of the first grip assembly (8), 10
- motorised actuator means (26, 27, 28) to simultaneously displace said first and second grip assembly (8, 9), starting from said gripping condition of the two jaws (29) of the second gripping assembly (8, 9) towards a position of introduction of said tip (A) of the stocking (C) between said pair of horizontal bars (4) of the conveyor (3) of the aforesaid sewing machine so as to introduce it into said guide slit (5) 25
- motorised actuator means to command said first grip assembly (8) and said second grip assembly (9) according to a sequential operating cycle. 30 35

8. A device as claimed in claim 7, **characterised in that** to said second grip assembly (9) is, operatively associated a blowing device (32) to send pressurised air towards the open tip (A) of the stocking (C) before its tensioning between said two hooks (10, 11) of the first grip assembly (8). 40

9. A device as claimed in claim 7 or claim 8, **characterised in that** to said second grip assembly (9) is operatively associated an upper suction device (33) to align the edge (B) of the open tip (A) of the stocking tensioned between said two hooks (10, 11) of the first assembly grip (8) relative to two jaws. 45 50

10. A device as claimed in any of the claims 7 through 9, **characterised in that** to said first grip assembly (8) is operatively associated a lower suction device (21) movable below said two hooks (10, 11) between a distal position and a proximal position relative to the stocking (C) suspended to said two hooks (10, 11) and movable, in said proximal position from a raised position to a lowered position. 55

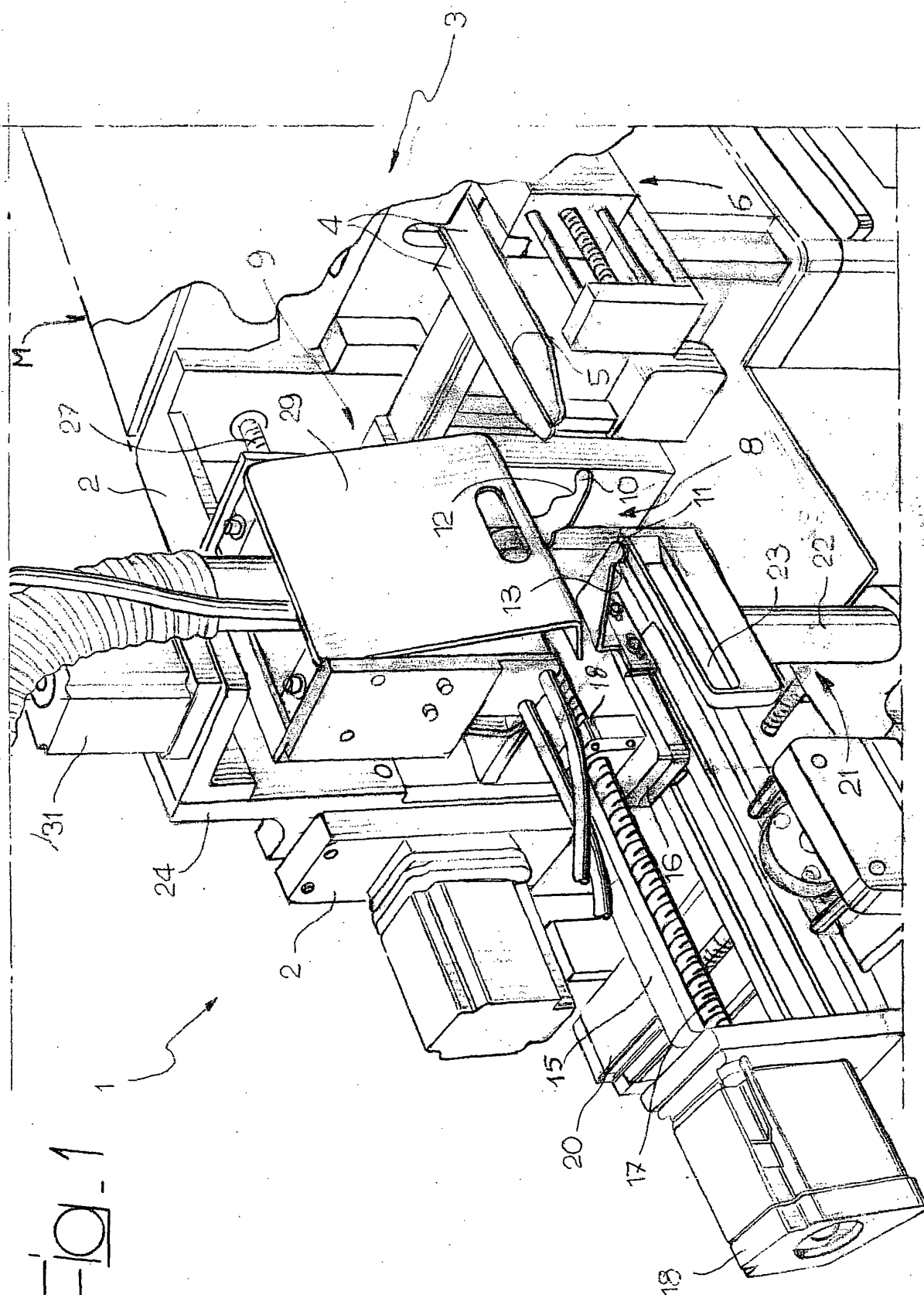
11. A device as claimed in any of the claims 7 through 10, **characterised in that** said two hooks (10, 11) of the first grip assembly (8) are also displaceable between an advanced position of lateral alignment with said conveyor assembly (39) of the sewing machine and a rearwards position.

12. A device as claimed in any of the claims 7 through 10, **characterised in that** it further comprises a movable pincer device (6) co-operating with said conveyor assembly (39) for driving the stocking (C) along said longitudinal guide slit (5).

13. A method for loading a stocking (C) as claimed in claim 5 on a conveyor assembly (3) of a sewing machine for sewing the open tip (A) of the stocking (C) said conveyor assembly (39) including a pair of horizontal bars (4) which delimit a longitudinal guide slit (5) for the insertion of the open tip (A) of the stocking (C), **characterised in that** it comprises the following operations:

- engaging said thread bridge (P), extending through the open tip (A) of said stocking (C) in such a way as to position said stocking (C) suspended to said thread bridge (P), laterally to said conveyor assembly (3),
- tensioning said bridge (P) to flatten said open tip (A) in a direction aligned with said longitudinal guide slit (5) of said conveyor assembly (3),
- aspirating upwards the edge (B) of the open tip (A) of the stocking (C),
- gripping said edge (B) of the open edge (A) of the stocking (C) parallel thereto,
- tensioning the stocking (C) in the opposite direction to said edge (B),
- translating the stocking (C) in such a way as to introduce said open tip (A) of the stocking (C) within said longitudinal guide slit (5) of the conveyor assembly,
- releasing said edge (B) of the open tip (A) of the stocking (C),
- freeing said thread bridge (P).

14. A method as claimed in claim 13, **characterised in that**, before the step of grabbing said edge (B) of the open tip (A) of the stocking (C), against said open tip (A) is sent a flow of pressurised air in the direction of suspension of the stocking (C).



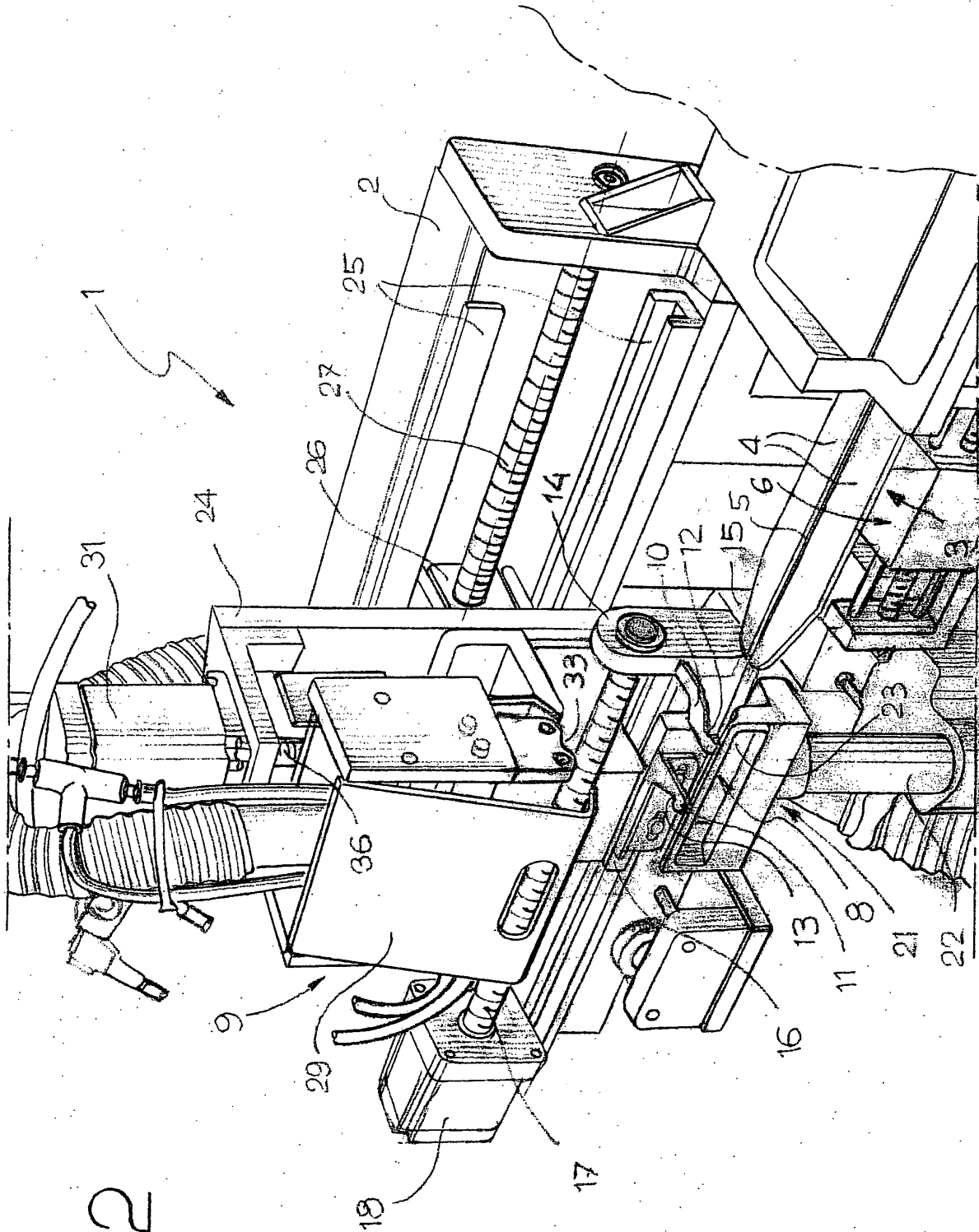


Fig. 2

Fig. 3

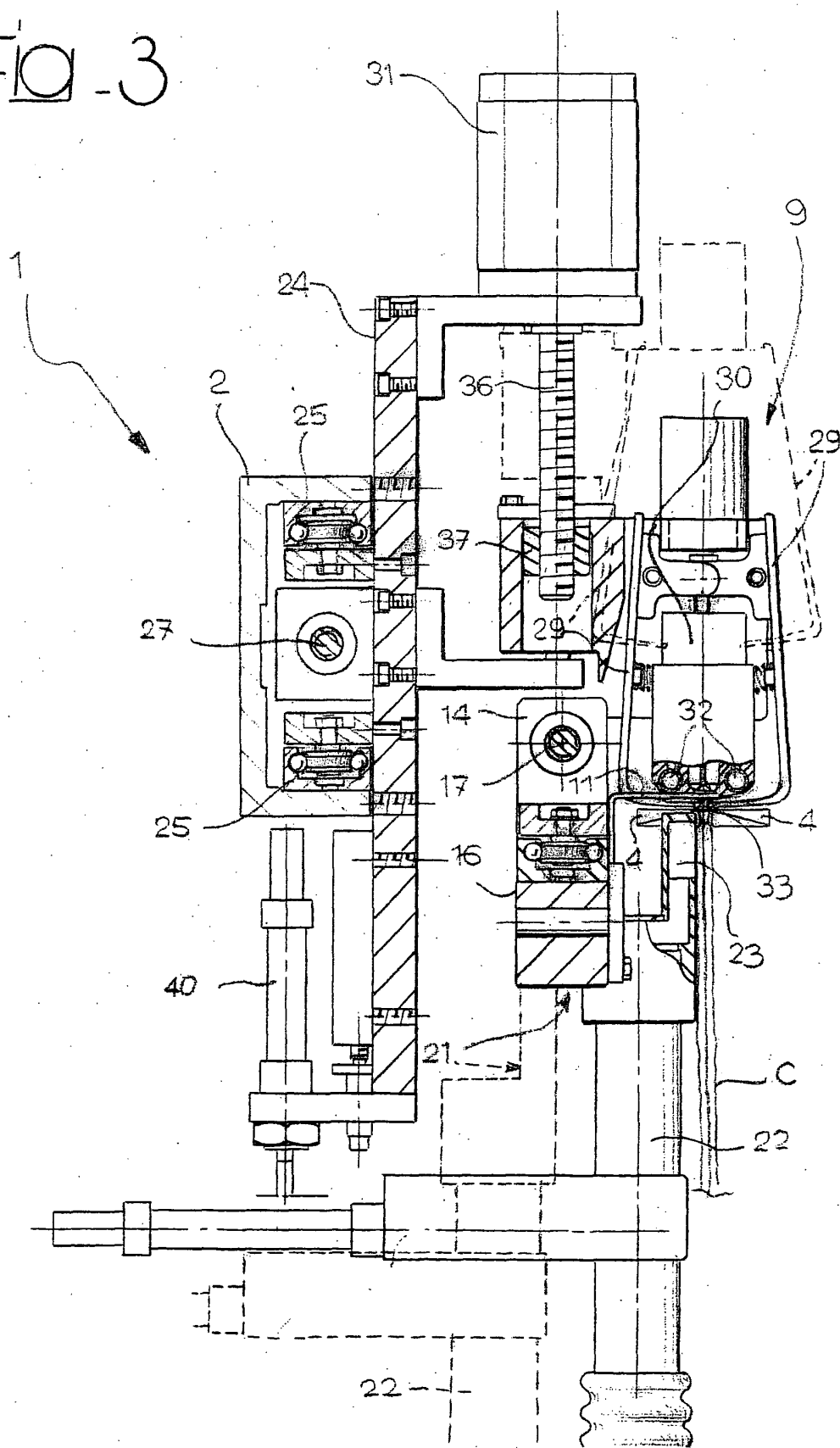


Fig. 4

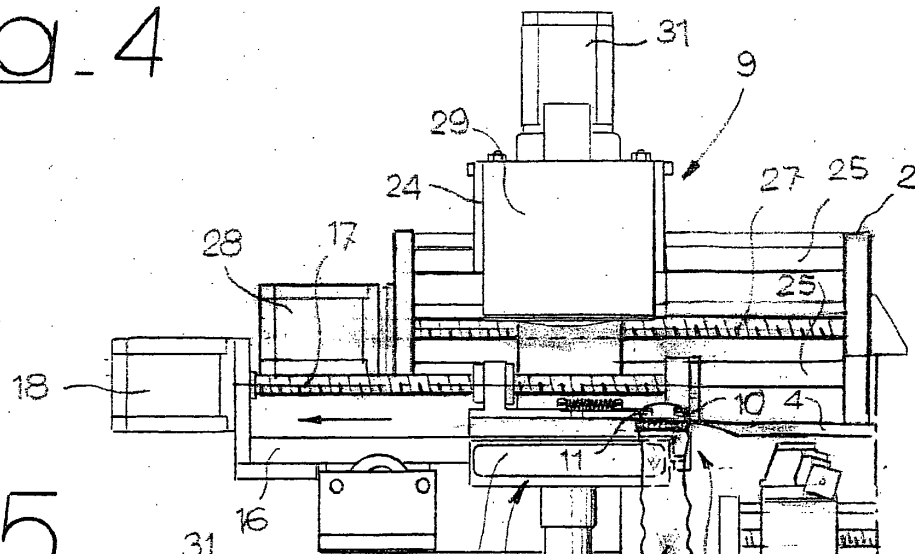


Fig. 5

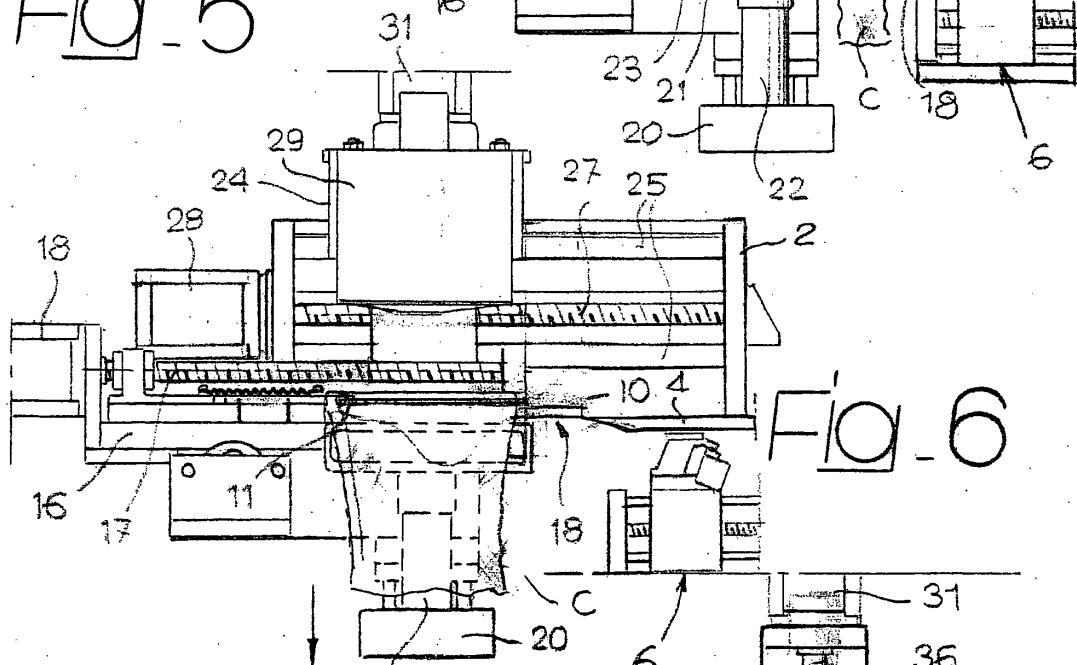
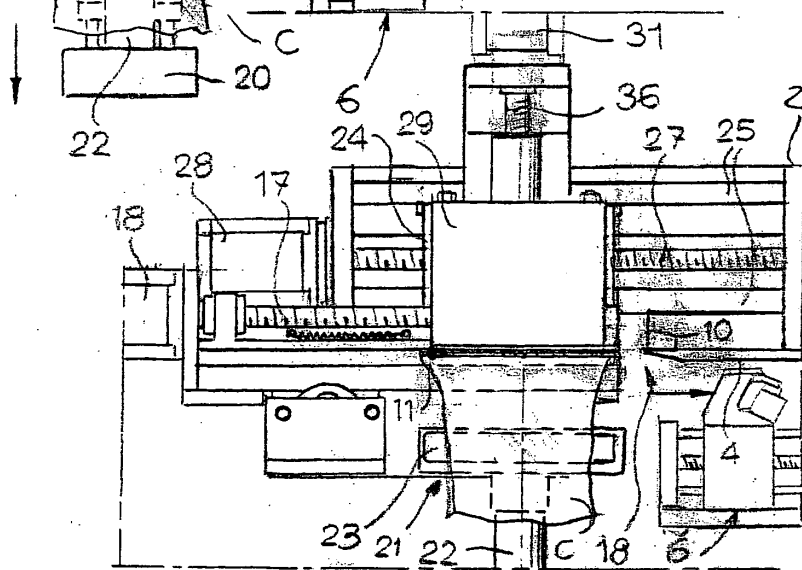


Fig. 6



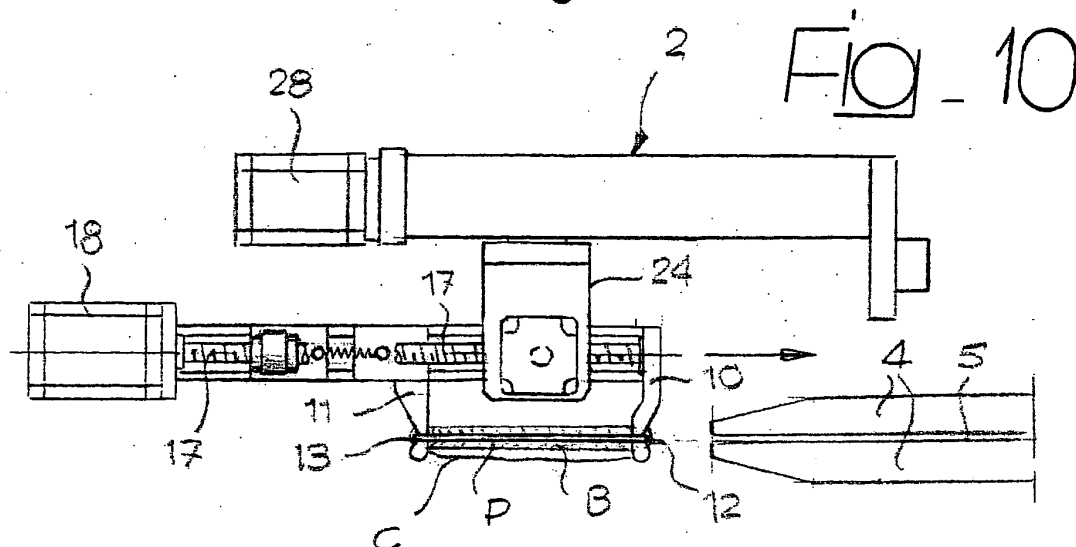
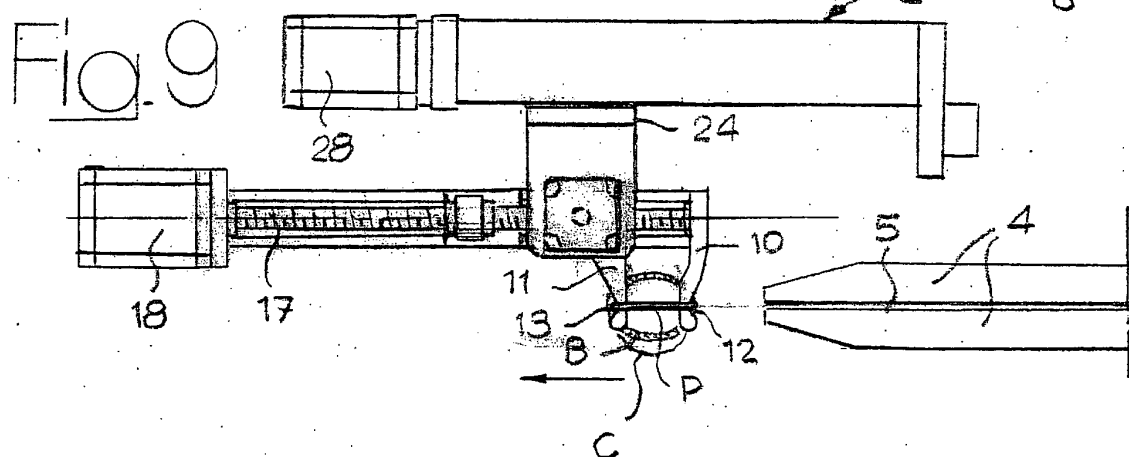
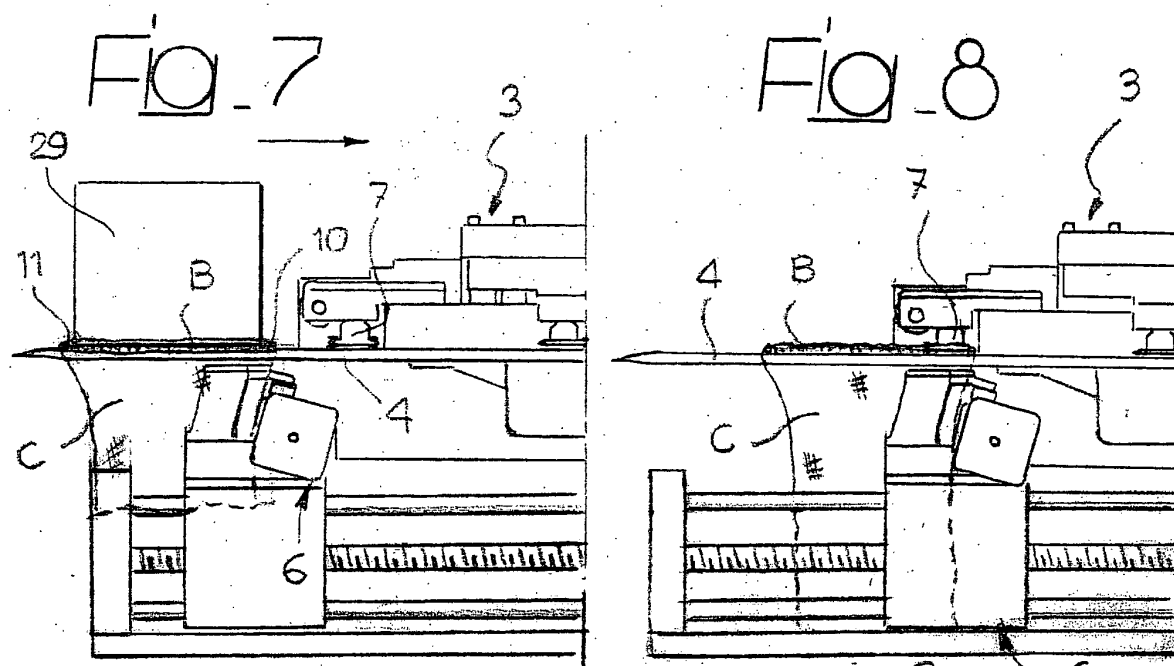


Fig. 11

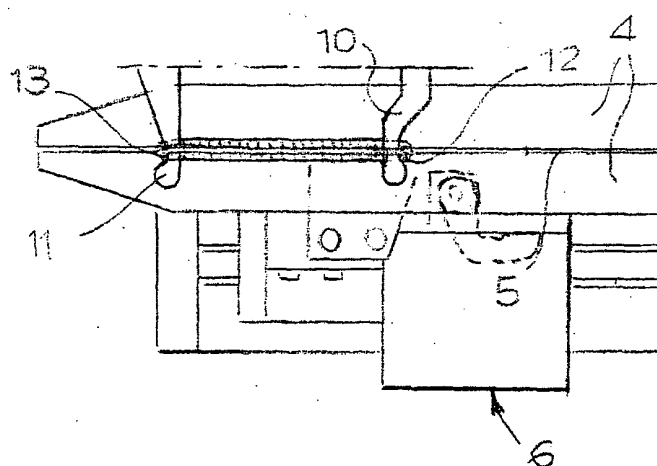


Fig. 12

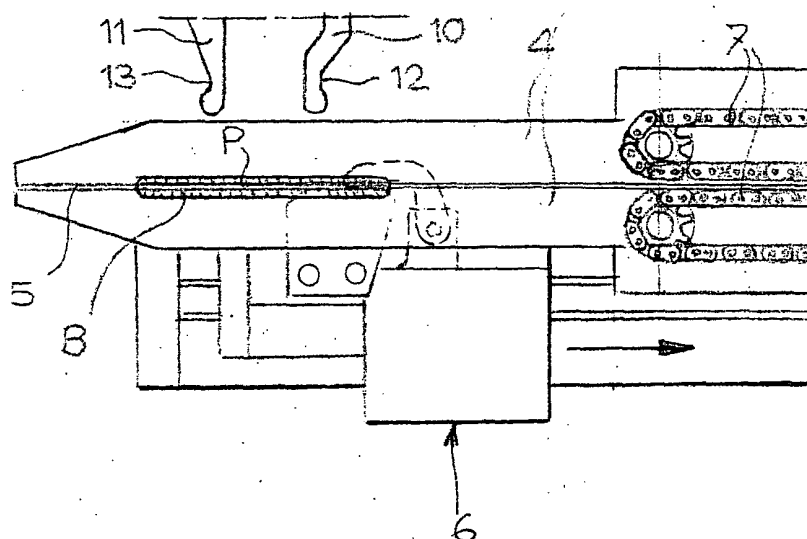


Fig. 13

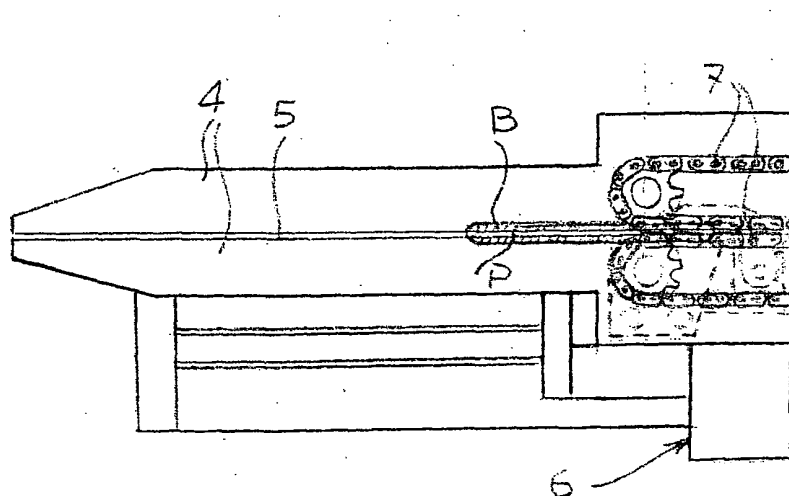


Fig. 14

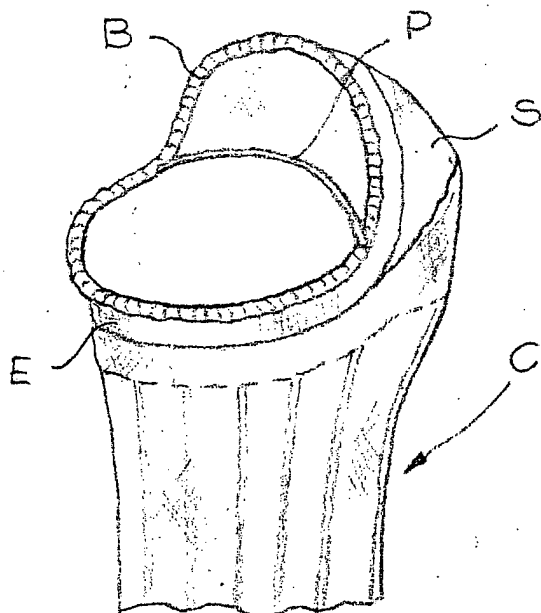


Fig. 15

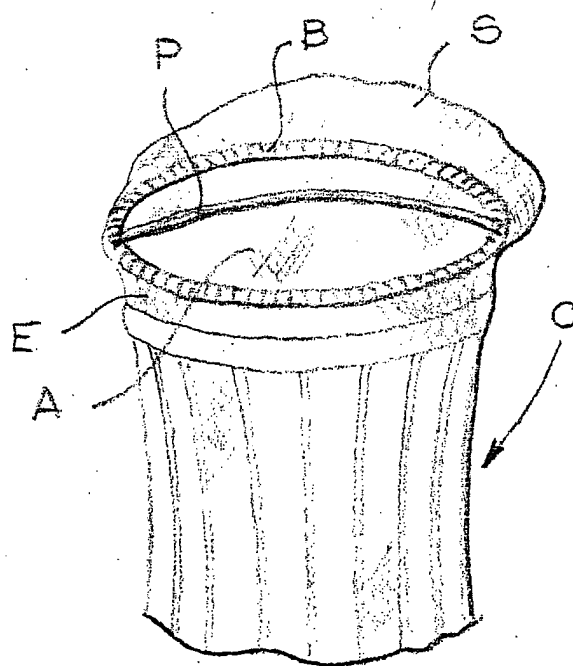


Fig. 16

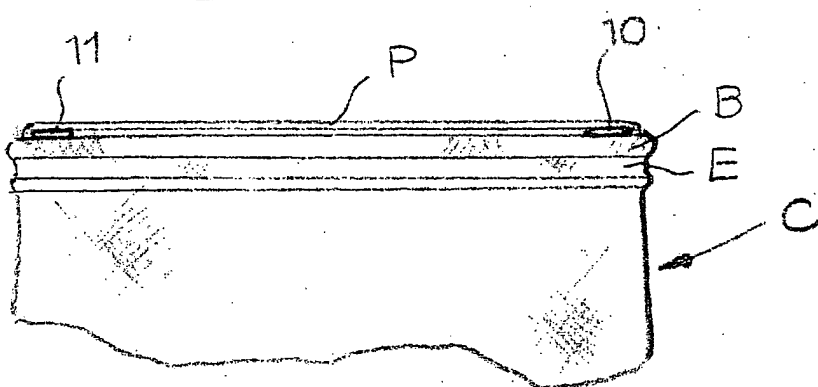


FIG. 17

