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(54) Machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire

(57) A machine (10) for labeling wire tagging sleeves (11) and for associating the wire tagging sleeves with a corresponding wire comprising means for printing wire tagging labels (13), which at the same time produce the advancement of the strip (17) toward laterally adjacent means (12) for the insertion of a label (13) in a pocket (11a) of a cable tagging sleeve (11), at which means (14) work for cutting to size the wire tagging sleeve (11) from a ribbon (15) of sleeve, a wire tagging sleeve (11) containing a label (13) being then moved to means (16) for separating the label (13) from the label supporting strip (17), and from there to subsequent means (18) for the insertion of an end portion (20) of a wire (21) in the corresponding elastic collar (11b) of the cable tagging sleeve (11).

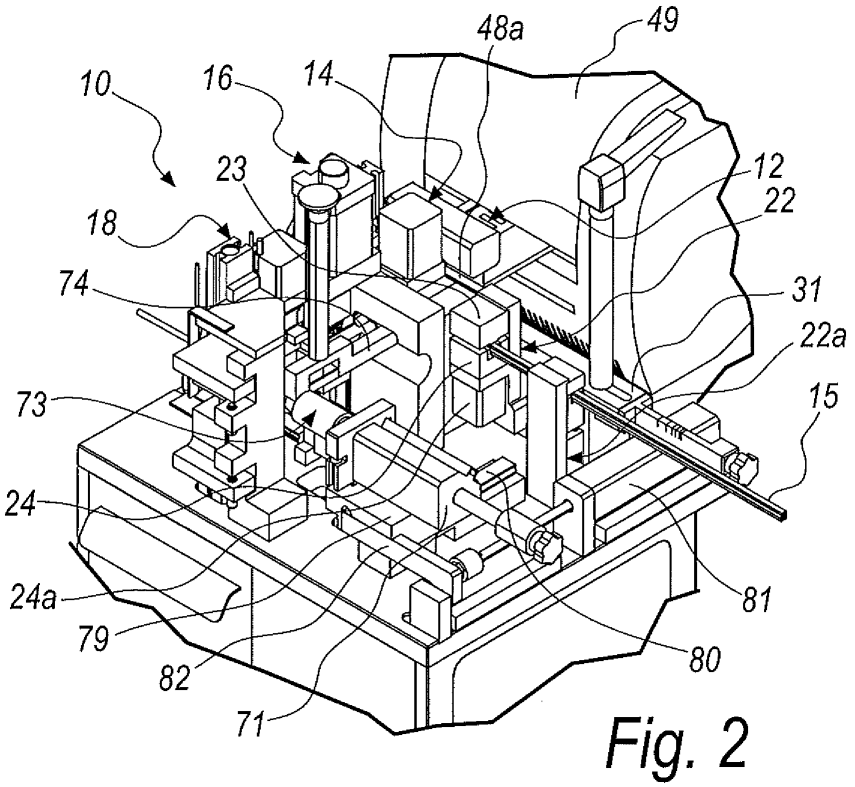

Fig. 2

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Description

[0001] The present invention relates to a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire.

[0002] In the provision of electrical panels, in order to identify uniquely an electrical wire, a plastic cuff, known in the jargon as sleeve, is applied to such wire.

[0003] Such sleeve generally comprises an elastic collar, which is deformable so as to adapt to the diameter of the wire to which it is applied, and a pocket, in which a wire tagging label or tag with an identification code of the electric wire is to be inserted.

[0004] Currently, the passage of the wire through the elastic collar and the insertion of the tag in the pocket of such sleeve are performed manually, with a considerable expenditure in terms of time and workforce.

[0005] The aim of the present invention is to provide a machine that automates these operations for preparing a wire tagging sleeve with a label and a wire with a corresponding wire tagging sleeve.

[0006] Within this aim, an object of the invention is to provide a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire that can be used with sleeves and labels having various shapes and dimensions.

[0007] Another object of the invention is to provide a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire that is compact and has a limited space occupation.

[0008] Another object of the invention is to provide a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire that allows to save in terms of labor for the manual operations for inserting a label in a pocket of a sleeve and for associating the sleeve with a corresponding wire.

[0009] Another object of the invention is to provide a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire that is easy to use and can be manufactured with known systems and technologies.

[0010] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a machine for labeling wire tagging sleeves and for associating said wire tagging sleeves with a corresponding wire, characterized in that it comprises:

- means for printing wire tagging labels;
- means for the insertion of a label in a pocket of a cable tagging sleeve;
- means for cutting to size the sleeve;
- means for separating the label from a label supporting strip;
- means for the insertion of an end portion of a wire in the corresponding elastic collar of said cable tagging sleeve.

[0011] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a machine for labeling wire tagging sleeves and for associating said wire tagging sleeves with a corresponding wire according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the machine according to the invention;
Figure 2 is a second perspective view of the machine according to the invention;
Figure 3 is a view of a wire tagging sleeve associated with a wire;
Figure 4 is a third perspective view of the machine according to the invention;
Figure 5 is a side view of the machine according to the invention;
Figure 6 is a perspective view of another embodiment of a detail of the machine according to the invention;
Figure 7 is a front perspective view of the machine according to the invention;
Figures 8 and 9 are side sectional views of the means for cutting to size a sleeve in two different steps of operation;
Figures 10 to 13 are views of the means for separating the label from the label supporting strip;
Figures 14 to 18 are views of the means for inserting an end portion of a wire in the corresponding elastic collar of the wire tagging sleeve.

[0012] With reference to the figures, a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire is generally designated by the reference numeral 10 in Figures 1 and 2.

[0013] The machine 10 for labeling wire tagging sleeves 11, the latter being clearly exemplified in Figure 3, comprises:

- means for printing wire tagging labels 13, described in greater detail hereinafter;
- means 12 for inserting a label 13 in a pocket 11a of a wire tagging sleeve 11;
- means 14 for cutting to size the wire tagging sleeve 11 from a ribbon 15 of sleeve;
- means 16 for separating the label 13 from the label supporting strip 17;
- means 18 for inserting an end portion 20 of a wire 21 in a corresponding elastic collar 11b of the wire tagging sleeve 11.

[0014] The printing means, described in greater detail hereinafter, are to be understood as being of a known type, print the labels 13 supported by the strip 17 and at the same time cause the advancement of the strip 17 with the labels 13 toward the subsequent means of the

machine 10.

[0015] Figures 2, 3 and 4 illustrate means 22 for the advancement of the ribbon 15 of sleeve, the ribbon 15 being intended to be cut to size.

[0016] The means 22 for the advancement of the ribbon 15 of sleeve are constituted by a pair of jaws 23 and 24 which are supported by a plate 25 and are designed to close onto each other by means of a first actuator 24a so as to engage the ribbon 15 of sleeve.

[0017] The plate 25 that supports the two jaws 23 and 24 for gripping the ribbon 15 of sleeve is in turn supported by a base 26, which is moved so as to perform an alternating transnational motion by a second actuator 28, which is visible in Figure 5; the base 26 is arranged so as to slide on a corresponding guide 29.

[0018] The means 22 for the advancement of the ribbon 15 of sleeve operate as described hereinafter: the first actuator 24a, which is visible in the perspective view of Figure 2, lifts the jaw 24 so as to close onto the other jaw 23, gripping the ribbon 15, the second actuator 28 causes the advancement of the base 26 on the guide 29 so that the ribbon 15 is moved toward the label insertion means 12.

[0019] While a sleeve 11 is cut from the ribbon 15, the second actuator 28 moves the jaws 23 and 24, which are open, away from the label insertion means 12 for a new grip on the ribbon 15.

[0020] The means 22 for the advancement of the ribbon 15 of sleeve also comprise locking means 22a, which are shown for example in Figure 2 and in Figure 4 and are also constituted by two mutually opposite jaws and an actuator that closes one jaw onto the other.

[0021] The locking means 22a are coordinated with the advancement means 22 so as to lock the ribbon 15 when the jaws 23 and 24, which are open, retract in order to perform a new grip on the ribbon 15; during this maneuver, the jaws 23 and 24 that clamped onto the ribbon 15, despite being opened, might in fact draw it away from the means 14 for cutting the ribbon 15.

[0022] The grip of the locking means 22a prevents such drawing away from the means 14 for cutting the ribbon 15.

[0023] In order to define the length of a sleeve 11 there are means 30, visible in Figure 4, for adjusting the length to which the sleeve is to be cut.

[0024] The means 30 for adjusting the length of a sleeve 11 are constituted by a plate 31, on which the means 14 for cutting to size the sleeve 11 from the ribbon 15 are mounted.

[0025] The plate 31 can be coupled to the footing 19 of the machine 10 in a series of different predefined positions, each of which is related to a length of sleeve 11 to be provided.

[0026] The plate 31 can be coupled reversibly, for example by means of a rod 32, to an actuation knob 32a, for the rotation of a threaded stem, which extends axially from the rod 32, to a block 33, which is fixed to the footing 19 and is provided with a hole which is threaded complementarily for the screwing of such stem.

[0027] The plate 31 has a slotted through opening 34, which is adapted to accommodate the threaded stem associated with the rod 32, not shown for the sake of simplicity, and to allow the positioning of the plate 31 in a position chosen among the predefined ones.

[0028] Such predefined positions are exemplified by the series of markings 35 provided on a portion of the maneuvering bar 36 of the plate 31.

[0029] The sectional view of Figure 8 shows that the plate 31 has a part that slides on a guide 37 and the part 31 supports the means 14 for cutting the ribbon 15 of sleeve.

[0030] The plate 31 is provided laterally with a recess 38, which is visible in Figure 4 and allows the stroke of the plate 25, which supports the jaws 23 and 24 for gripping the ribbon 15 of sleeve, between two abutments.

[0031] The two stroke limits for the movement of the plate 25, which are adjustable according to the chosen length of the sleeve, are constituted by a first threaded element 39a, which can be glimpsed in Figure 4, is screwed to the plate 25 and is designed to abut against a rear face of the recess 38, and a second threaded element 39b, which is visible in Figure 5 and is screwed to a support 40.

[0032] The support 40 supports the label insertion means 12, as can be seen in Figure 5.

[0033] The means 12 for the insertion of a label 13 in a pocket 11a of a wire tagging sleeve 11 are shown in Figures 7 and 8 and comprise:

- a locking device 41 for a label 13 in a region of advancement of the free end of the ribbon 15 of wire tagging sleeve,
- a channel 42 for guiding the ribbon 15 of sleeve, which originates from the advancement means 22, toward engagement with a label 13.

[0034] The locking device 41, in the embodiment of the machine 10 described here by way of non-limiting example of the invention, comprises a plurality of pointed bars 43, which are clearly visible in Figure 7 and are moved vertically by a third actuator 44 so as to enter and exit from corresponding holes 45 provided in the strip 17 that supports the labels 13.

[0035] In the embodiment of the machine 10 according to the invention, described here by way of non-limiting example of the invention, the locking device 41 for the insertion of the label 13 in the pocket 11a of the sleeve 11 comprises a bar 46 which has a fork-shaped end, which is moved by a fourth actuator 47 and is shaped so as to surround in an upper region and in a lower region a label 13 and is moved so as to guide the label 13 and facilitate and ensure the correct insertion of the label 13, as shown schematically in the sectional view of Figure 8.

[0036] Figure 8 illustrates the fourth actuator 47, the stem 47a of which supports at its end an arm 48, which supports the bar 46 with a fork-shaped end.

[0037] The fourth actuator 47, as a consequence of the insertion of the label 13, moves the fork-like bar 46 backward and makes it available for the subsequent label 13.

[0038] The retracting motion of the fork, as an alternative, can be provided by a push rod 48a, which is visible in Figures 1, 2 and 8 and is fixed to the plate 25 of the advancement means 22 and pushes the arm 48 that supports the fork-like bar 46 away from the labels 13; with this solution, the retracting motion of the fork-like bar 46 is synchronized mechanically with the advancement motion of the ribbon 15 of sleeve, which is indeed provided by the advancement means 22.

[0039] The strip 17 for supporting the labels 13 has the grip and locking holes 45 which are offset with respect to the labels 13, so that the fork-like bar 46 can access the labels 13 without encountering the obstacle of the one or more pointed locking bars 43.

[0040] The advancement of the label supporting strip 17 is controlled by a label printer 49, which is visible in Figures 1 and 2, and the operation of the machine 10 synchronized with the operation of the printer 49.

[0041] The printer 49 is to be understood as being of a per se known type and of the programmable type as regards printing sequences, i.e., capable of alternating a certain number of codes or lettering to be printed on the labels 13.

[0042] In this manner, a sequence of distinct wires 21 is obtained in output from the machine 10, each one with its particular label 13 appropriately marked, as occurs in the normal requirements of an operator who has to wire an electrical panel.

[0043] In order to be able to provide printing of a certain quality on the label 13 it is preferable to use a printer 49 of the thermal transfer type, which is per se known and commercially available; in order to use such a printer, the labels 13 must have a modest thickness, i.e., approximately half a millimeter.

[0044] In order to ensure correct insertion of the label 13 in the pocket 11a of the sleeve 11, avoiding bending and jamming of the ribbon 15 of sleeve, the bar 46 with fork-like end described above is provided.

[0045] In a further embodiment, the machine 10 has its own means 150 for the advancement of the strip 17, which are exemplified in Figure 6.

[0046] The advancement means 150 for the strip 17 comprise a first actuator 144 for the vertical movement of a spike 143, which is designed to lock the strip 17 by entering one of the holes 45 of the strip 17, and a second actuator 151.

[0047] The first actuator 144 is made to perform an alternating translational motion horizontally by the second actuator 151, which moves the slider 152 that supports the first actuator 144; with the two actuators 144 and 151, the stepwise advancement of the strip 17 is provided and is synchronized by the electronic control unit of the machine 10 with the movement of the means 22 for the advancement of the ribbon 15 of sleeve.

[0048] The insertion of a label 13 in the pocket 11a of a sleeve 11 is exemplified in Figures 8 and 9, which show the strip 17 locked so that a label 13 is arranged exactly at the guiding channel 42 of the ribbon 15 of sleeve, so that as the ribbon 15 advances the label 13 is inserted in a corresponding portion of pocket of the ribbon 15 of sleeve.

[0049] The bar 46, by surrounding the label 13 with its fork-like end, prevents the label 13 from bending or jamming against the advancing ribbon 15 of sleeve, thus preventing any jamming.

[0050] When the ribbon 15 of sleeve advances, the bar 46 retracts, allowing the correct insertion of the label 13 in the portion of pocket of the sleeve.

[0051] The means 14 for cutting to size the wire tagging sleeve 11 from the ribbon 15 of sleeve are also clearly visible in the sectional views of Figures 8 and 9 and comprise a blade 53 which is supported and actuated by a fifth actuator 54, which in turn is supported by the plate 31, by interposition of other structural supporting components 55.

[0052] The leading labels of the label supporting strip 17, which support an associated sleeve 11, advance together with the strip 17, always moved by the associated printer 49 or by the described alternative advancement means 150, up to the means 16 for separating the label 13 from the label supporting strip 17.

[0053] The means 16 for separating the label 13 from the label supporting strip 17 are constituted by means 56 for gripping a sleeve 11 with a label 13 and for moving the sleeve 11 in a cutting direction, such cutting occurring by means of a second blade 57, which is clearly visible in Figures 12 and 13 and whose edge is arranged at the joining line between the label supporting strip 17 and the labels 13.

[0054] The grip and movement means 56, which are clearly visible in Figures 10 and 11, are constituted by two mutually opposite blocks, a first upper block 58, which is actuated vertically by a sixth actuator 59, and a second lower block 60, which is actuated by a seventh actuator 61.

[0055] The second block 60 has two receptacles for a sleeve 11, each receptacle 62 and 63 having different dimensions in order to adapt to sleeves having corresponding different dimensions.

[0056] Figure 10 shows how the lower block 60 can slide on a rail 64 and can be locked reversibly thereon in a position chosen between two positions, a first position for the selection of use of a first receptacle 62 for a sleeve 11 with a label 13 and a second position related to the use of the second receptacle 63.

[0057] Figure 11 also illustrates means for removing the leading portion 17a to be rejected of the strip 17, which lacks the labels 13.

[0058] Such removal means provide for an eighth actuator 65, which is designed to actuate a third blade 66, which is adapted to cut the leading portion 17a of the strip 17.

[0059] The leading portion 17a, once separated from the strip 17, falls into an underlying tube 67 for removing waste.

[0060] Figure 12 clearly illustrates the second blade 57.

[0061] When a sleeve 11 arrives, supported by the corresponding label 13 inserted therein, at the predefined receptacle, for example a first receptacle 62, the second block 60, for supporting the sleeve 11, moves vertically upward and accommodates within its first receptacle 62 the sleeve 11, which supports in its pocket 11a the label 13 which is still joined to the strip 17; the first block 58 is actuated by an actuator, the sixth actuator 59, which acts downward from above and is more powerful than the seventh actuator 61, so that the action of the sixth actuator 59 closes the first block 58 on the second receptacle 62 of the second block 60 and lowers the interposed sleeve 11 so as to draw the joining bridge between the strip 17 and the label 13 against the underlying second blade 57, thus producing the separation of the label 13, with the sleeve 11, from the strip 17, as shown in Figure 13.

[0062] The grip and movement means 56 simultaneously place the sleeve 11 with the label 13 in the region assigned to the association of a wire 21 with the sleeve 11.

[0063] The means 18 for the insertion of an end portion 20 of a wire 21 in the corresponding elastic collar 11b of the wire tagging sleeve 11 comprise:

- means for divaricating the elastic collar 11b
- and means for inserting a wire conduit so as to pass through such elastic collar.

[0064] The means for divaricating the elastic collar 11b, in this embodiment, which is a non-limiting exemplifying embodiment of the invention, are constituted by a pin 68, which is actuated horizontally by a ninth actuator 69, visible in Figure 14, by means of a supporting arm 70.

[0065] The pin 68 enters the elastic collar 11b, as visible in Figure 14, and adapts to the cylindrical shape of the pin 68.

[0066] When the sleeve 11 is supported by the pin 68, a wire guiding divarication tube 72 is made to advance by a tenth actuator 71, which is visible in Figures 1, 2, 4 and 14 and is first pushed in abutment against the tip of the pin 68 and then inside the collar 11b instead of the pin 68, which retracts while the divarication tube 72 advances within the collar 11b, until the sleeve 11 is supported completely by the divarication tube 72 as shown in Figure 15.

[0067] The divarication tube 72 is supported not only by the tenth actuator 71 but also by a telescopic sleeve 73 which is fixed to such tenth actuator.

[0068] The telescopic sleeve 73 is composed of a first tubular element 73a, which is fixed to the body of the tenth actuator 71, and a second tubular element 73b, which is contoured so as to slide on the first element 73a.

[0069] The position of the second tubular element 73b with respect to the first tubular element 73a is determined by a bar 74, which is arranged with its end in an annular recess 75 defined on the second tubular element 73b; at the opposite end, the bar 74 is jointly connected to the plate 31.

[0070] By means of the bar 74, the movement of the plate 31 for the adjustment of the cutting length of the sleeve 11 entails the mechanical transmission of an identical movement also to the second tubular element 73b with respect to the first tubular element 73a of the telescopic sleeve 73; in this manner, the divarication tube 72 is subjected to a translational motion by the stem of the tenth actuator 71 so as to protrude from the sleeve 73 by a length that is equal to the predefined length of the sleeve 11.

[0071] The machine 10 also comprises centering means 76, which are adapted to guide and facilitate the entry of the end 20 of a wire 21 in the wire guiding divarication tube 72.

[0072] The sleeve 11 supported by the divarication tube 72, once the blocks 58 and 60 have been opened, is moved at the centering means 76 by means of the translational motion performed on the tenth actuator 71, which is supported by a corresponding slider 79 on a guide 80, on the part of an eleventh actuator 81, by means of a connecting bar 82, as clearly visible in Figure 2.

[0073] The centering means 76, clearly visible in Figures 16 to 18, are constituted by two mutually opposite centering bodies 77 and 78, outside which a series of half frustum-shaped recesses 83, 83a and others for a first centering body 77 and 84, 84a and onward for the second centering body 78 is defined, each being designed to face the corresponding half frustum-shaped recess defined on the other centering body, in order to define a frustum-shaped tubular inlet 85 adjacent to the inlet of the divarication tube 72.

[0074] The inlet 85 acts as a guide for the end portion 20 of a wire 21 toward the mouth of the divarication tube 72, as shown in Figure 16.

[0075] The two centering bodies 77 and 78 are moved vertically so as to close onto each other by a twelfth actuator 86, which is visible in Figure 17.

[0076] The two centering bodies are each supported by a corresponding block 87 and 88, each associated with a corresponding slider 89 and 90, both sliders being arranged so as to slide on a same guide 91, which is fixed to a support 91a, jointly connected to the footing 19, as shown in Figure 1.

[0077] The twelfth actuator 86 is fixed to one of the two blocks, for example to the lower block 88.

[0078] The open and closed positions of the two centering bodies 77 and 78 are defined by the respective stroke limits 92 and 93 for the upper block 87 and 94 and the base 94a of the support 91a of the guide 90 for the lower block 88.

[0079] The centering bodies 77 and 78, as mentioned above, have a plurality of half frustum-shaped recesses of various sizes for providing frustum-shaped guiding in-

lets for wires having a different cross-section.

[0080] The centering bodies 77 and 78 can be rotated in a revolver-like fashion for the quick setup of the machine 10 so as to adapt to the cross-section of the preset wires 21 with which the sleeves 11 are to be associated.

[0081] Means 96 for gripping the wire 21 are associated with the centering means 76.

[0082] The grip means 96 for the wire 21 are constituted by a clamp 97, which is actuated by a thirteenth actuator 98.

[0083] The wires 21 can be sent to the centering means 76 either manually, by an operator, or by means of an associated automatic machine, which is to be understood as being of a per se known type.

[0084] The grip means 96 also comprise means for detecting the wire 21 proximate to the grip means, so that such grip means can be activated automatically to close onto the wire 21.

[0085] In the present non-limiting embodiment of the invention, such detection means are constituted by mutually opposite photocells 99, which are fixed to the support 91a of the guide 91 and are interposed between the jaws of the clamp 97 and the centering bodies 77 and 78.

[0086] In Figure 18, a sectional side view shows a wire 21 which supports a wire tagging sleeve 11 with a label 13, with a divarication tube 72 retracted within the second tubular element 73b of the telescopic sleeve 73.

[0087] The machine 10 according to the invention advantageously can be associated with a crimping machine, providing a semiautomatic machine in which wires that have already been cut and stripped at their end are associated with the sleeves and then need only to be crimped, an operation that can be performed by an operator or by an additional crimping unit.

[0088] In practice it has been found that the invention achieves the intended aim and objects.

[0089] In particular, the present invention provides a machine that automates the operations for providing a wire tagging sleeve with a label and a wire with a corresponding wire tagging sleeve.

[0090] Furthermore, the present invention provides a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire which can be operated with sleeves and labels having various shapes and sizes, thanks to the versatility of the grip and movement means 56 and of the centering means 76.

[0091] Moreover, the present invention provides a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire which is compact and has limited space occupation and therefore can be associated easily with other machines for working electrical wires of the known type.

[0092] The present invention therefore allows to save in terms of labor for the manual operations for inserting a label in a pocket of a sleeve and of associating the sleeve with a corresponding wire, with great convenience for operators of the field in terms of installation time requirements of electrical panels and in terms of labor.

[0093] Moreover, the present invention provides a machine for labeling wire tagging sleeves and for associating such wire tagging sleeves with a corresponding wire which is structurally simple, easy to use, and can be manufactured with components, systems and technologies of a per se known type.

[0094] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0095] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0096] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A machine (10) for labeling wire tagging sleeves (11) and for associating said wire tagging sleeves with a corresponding wire, **characterized in that** it comprises:

   - means for printing wire tagging labels (13), which are adapted to print the labels (13) carried by a strip (17) and at the same time produce the advancement of said strip (17) toward laterally adjacent
   - means (12) for the insertion of a label (13) in a pocket (11a) of a cable tagging sleeve (11), at which
   - means (14) work for cutting to size the wire tagging sleeve (11) from a ribbon (15) of sleeve, a wire tagging sleeve (11) containing a label (13) being then moved to
   - means (16) for separating the label (13) from the label supporting strip (17), and from there to subsequent
   - means (18) for the insertion of an end portion (20) of a wire (21) in the corresponding elastic collar (11b) of said cable tagging sleeve (11).

2. The machine according to claim 1, **characterized in that** it comprises means (22) for the advancement of the ribbon (15) of sleeve to be cut to size.

3. The machine according to claim 2, **characterized in that** said means (22) for the advancement of the ribbon (15) of sleeve are constituted by a pair of jaws (23, 24) carried by a plate (25) and designed to close

onto each other by means of a first actuator (24a) to pick up the ribbon (15) of sleeve, said plate (25) being carried by a base (26) that is moved so as to perform a translational motion alternately on a guide (29) by a second actuator (28).

4. The machine according to the preceding claims, **characterized in that** it comprises means (30) for adjusting the length of a sleeve (11).

5. The machine according to claim 4, **characterized in that** said means (30) for adjusting the length of a sleeve (11) are constituted by a plate (31) on which the means (14) for cutting to size the sleeve (11) from the ribbon (15) are fitted, said plate (31) being reversibly associable with the footing (19) of the machine (10) in a series of different predefined positions, each of which is related to a length of sleeve (11) to be provided.

6. The machine according to the preceding claims, **characterized in that** said means (12) for the insertion of a label (13) in a pocket (11a) of a wire tagging sleeve (11) comprise:

- a device (41) for locking a label (13) in a region of forward travel of the free end of the ribbon (15) of wire tagging sleeve,
- a channel (42) for guiding the ribbon (15) of sleeve toward engagement with a label (13).

7. The machine according to claim 6, **characterized in that** said locking device (41) comprises a plurality of pointed bars (43), which are moved vertically by a third actuator (44), so as to enter and exit from corresponding holes (45) provided in the strip (17) that supports the labels (13).

8. The machine according to the preceding claims, **characterized in that** the locking device (41) for the insertion of the label (13) in the pocket (11a) of the sleeve (11) comprises a bar (46) with a fork-shaped end, which is moved by a fourth actuator (47), is contoured so as to surround in an upper region and in a lower region a label (13), and is moved so as to accompany the label (13) within the pocket (11a) of the sleeve (11).

9. The machine according to the preceding claims, **characterized in that** the means (14) for cutting to size the wire tagging sleeve (11) from the ribbon (15) of sleeve comprise a blade (53) which is carried and actuated by a fifth actuator (54).

10. The machine according to the preceding claims, **characterized in that** the means (16) for separating the label (13) from the label supporting strip (17) are constituted by means (56) for gripping a sleeve (11) with a label (13) and for moving the sleeve (11) in a cutting direction, said cutting occurring by means of a second blade (57), the cutting edge of which is arranged at the line of the joints between the label supporting strip (17) and the labels (13) themselves.

11. The machine according to claim 10, **characterized in that** said grip and movement means (56) are constituted by two mutually opposite blocks, a first upper block (58), which is actuated vertically by a sixth actuator (59), and a second lower block (60), which is actuated by a seventh actuator (61), said second block (60) having at least two receptacles for a sleeve (11), each seat (62, 63) having different dimensions in order to adapt to sleeves of corresponding different dimensions.

12. The machine according to the preceding claims, **characterized in that** said means (18) for the insertion of an end portion (20) of a wire (21) in the corresponding elastic collar (11b) of said wire tagging sleeve (11) comprise:

- means for divaricating the elastic collar (11b)
- and means for inserting a wire guiding divarication tube (72) so as to pass through said elastic collar.

13. The machine according to claim 12, **characterized in that** said means for the divarication of the elastic collar (11b) are constituted by a pin (68), which is actuated horizontally by a ninth actuator (69) by virtue of a supporting arm (70), said pin (68) being adapted to enter the elastic collar (11b), said collar adapting to the cylindrical shape of the pin (68), a wire guiding divarication tube (72) being made to advance with the sleeve (11) on the pin (68) by a tenth actuator (71) and being pushed first into abutment against the tip of the pin (68) and then inside the collar (11b) as a replacement of said pin (68), which retracts.

14. The machine according to the preceding claims, **characterized in that** it comprises centering means (76) adapted to guide and facilitate the entry of the end (20) of a wire (21) in the wire guiding divarication tube (72).

15. The machine according to claim 14, **characterized in that** said centering means (76) are constituted by two mutually opposite centering bodies (77, 78), outside which there is a series of half-frustum-shaped recesses (83, 83a, 84, 84a), each of which is designed to face the corresponding half-frustum-shaped recess formed on the other centering body, in order to form a frustum-shaped tubular inlet (85) adjacent to the inlet of the divarication tube (72).

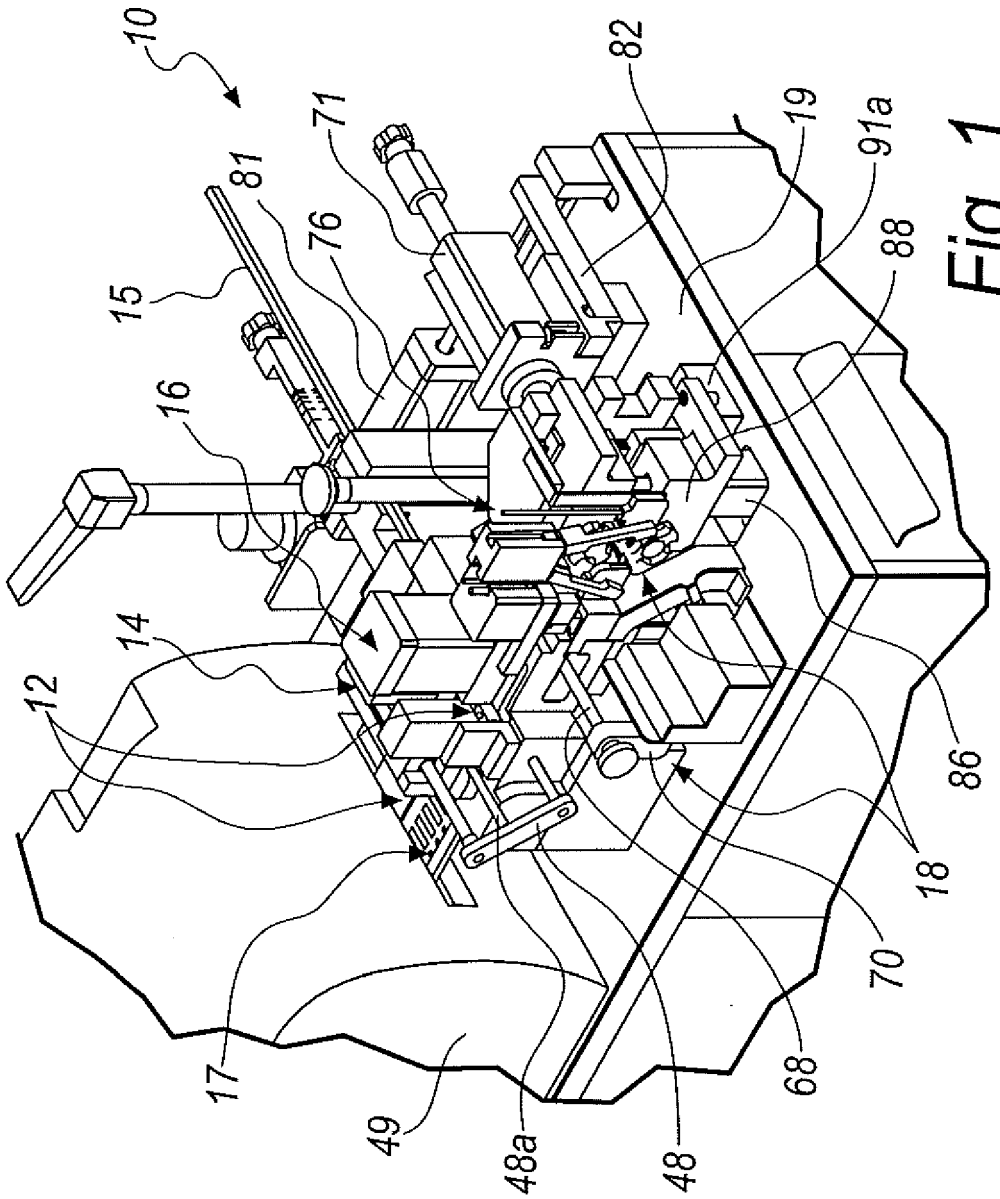

Fig. 1

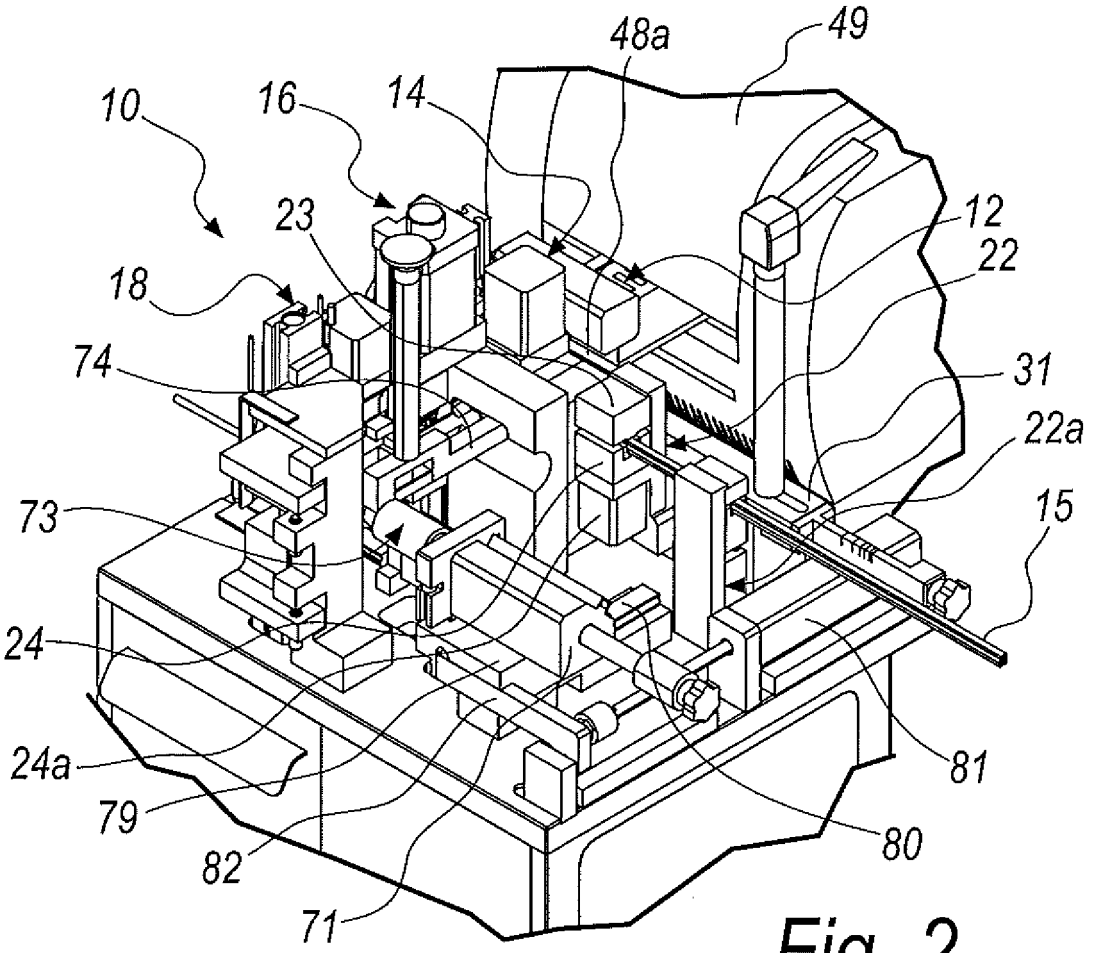
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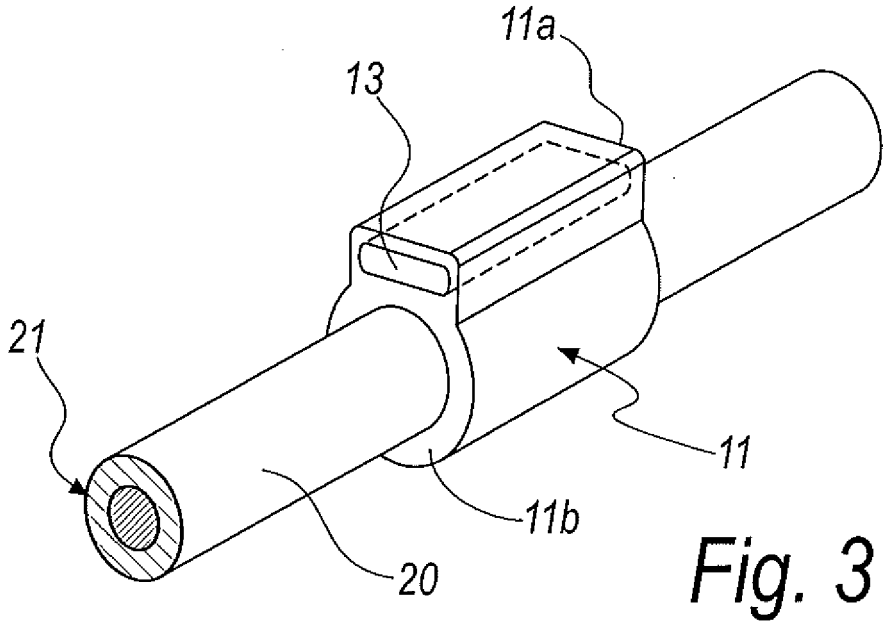
Fig. 2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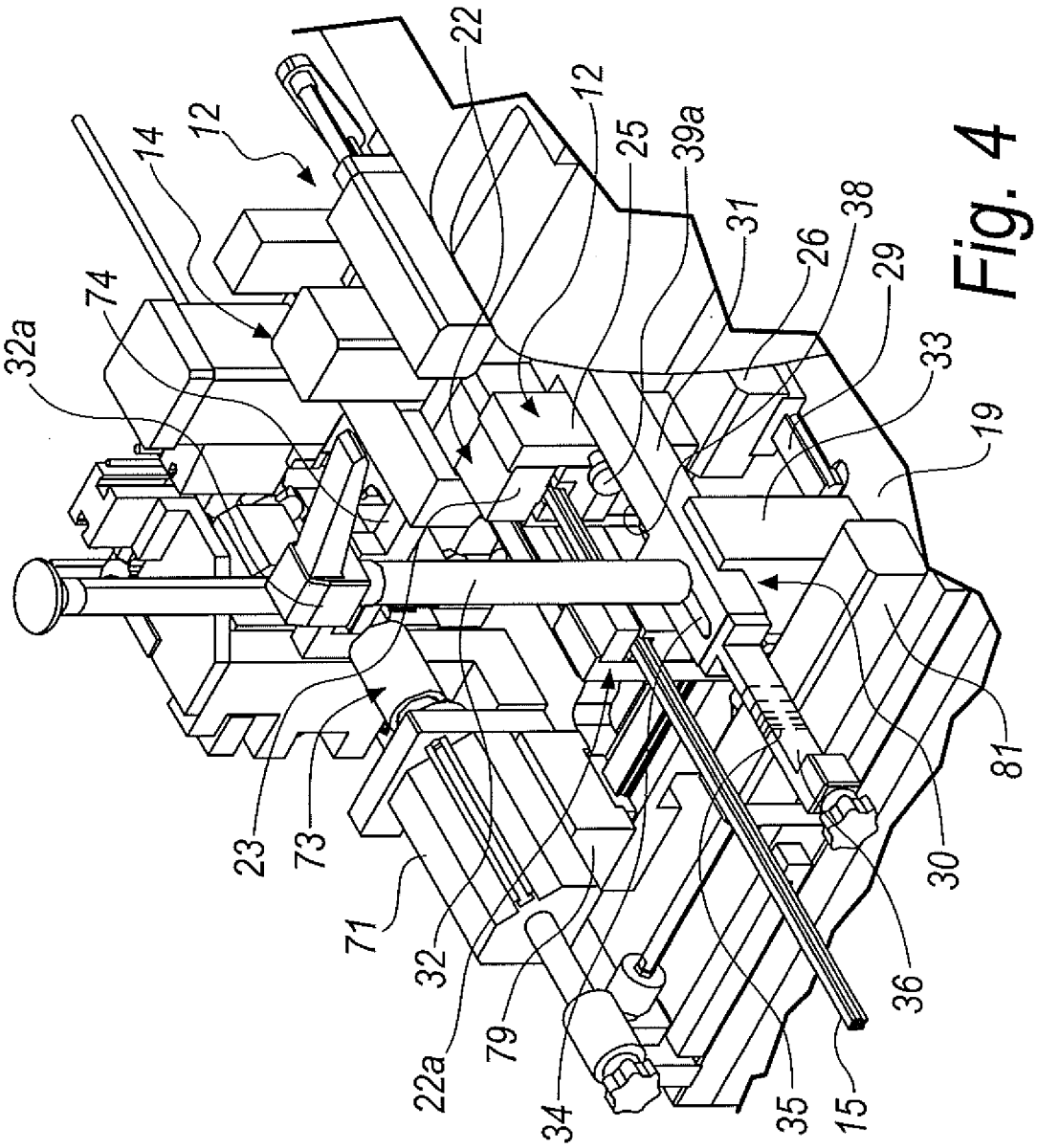
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Fig. 4

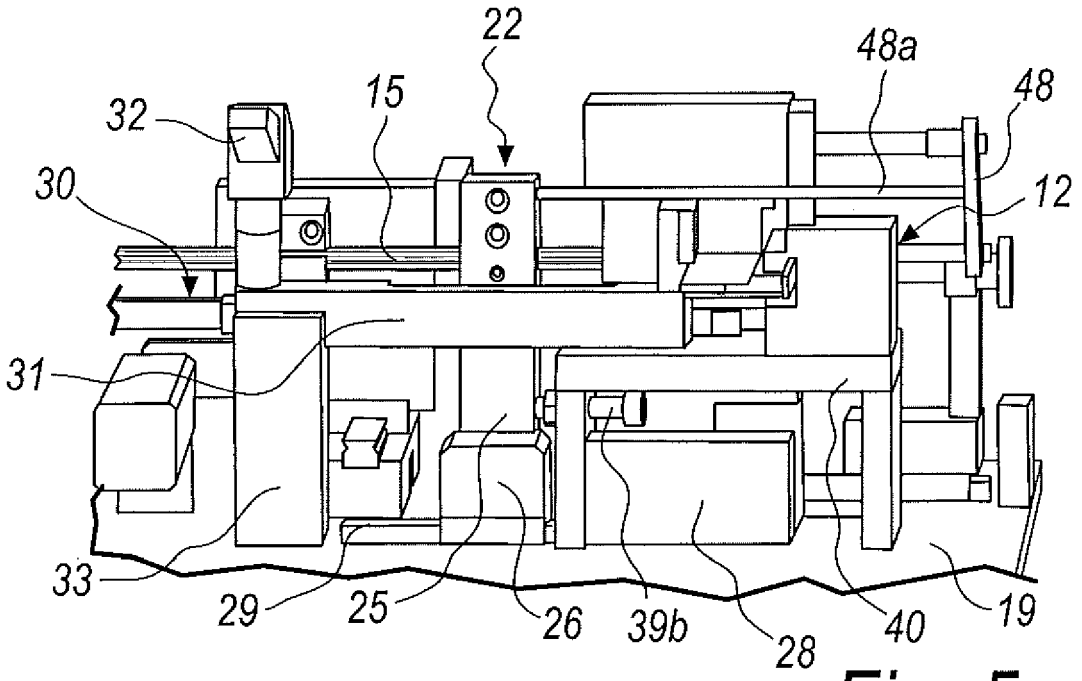
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Fig. 5

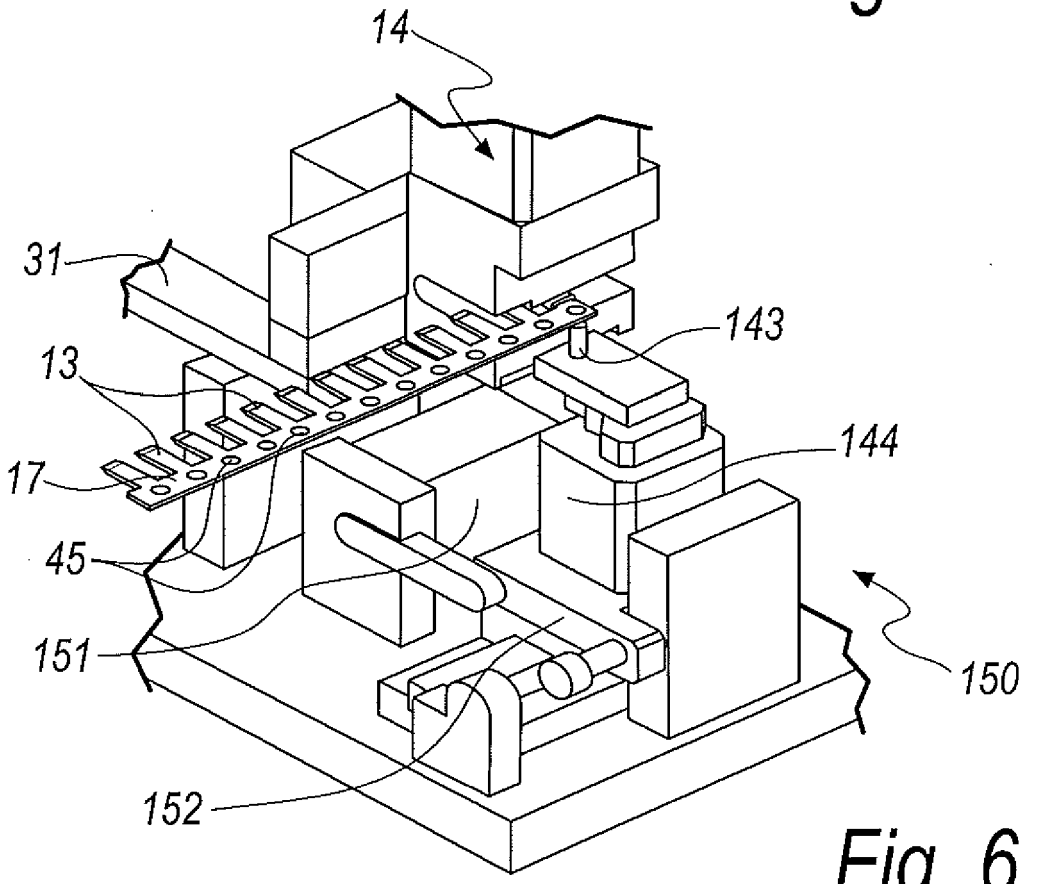
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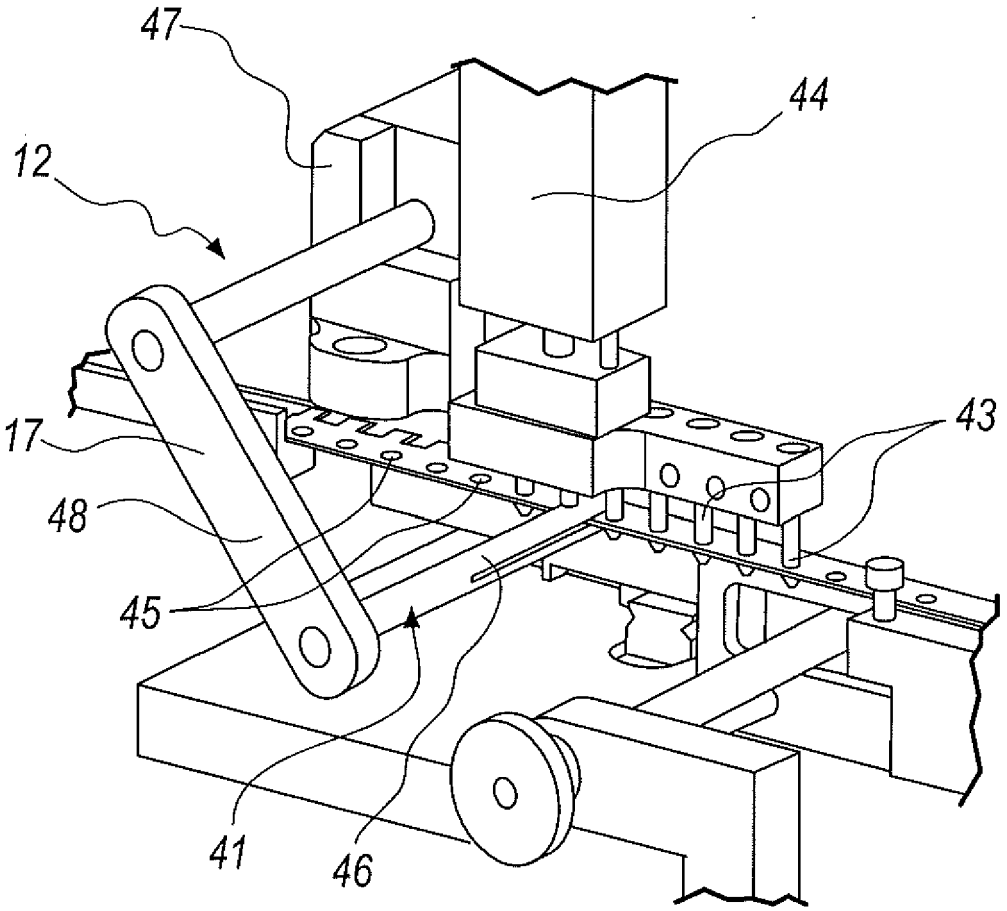
Fig. 6



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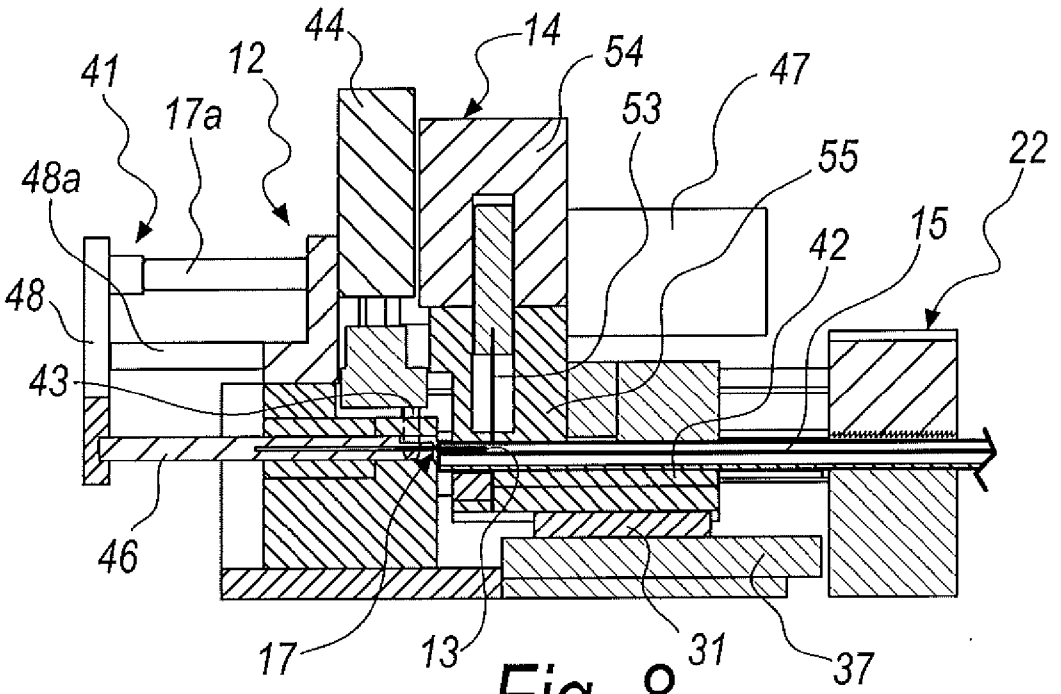
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Fig. 8

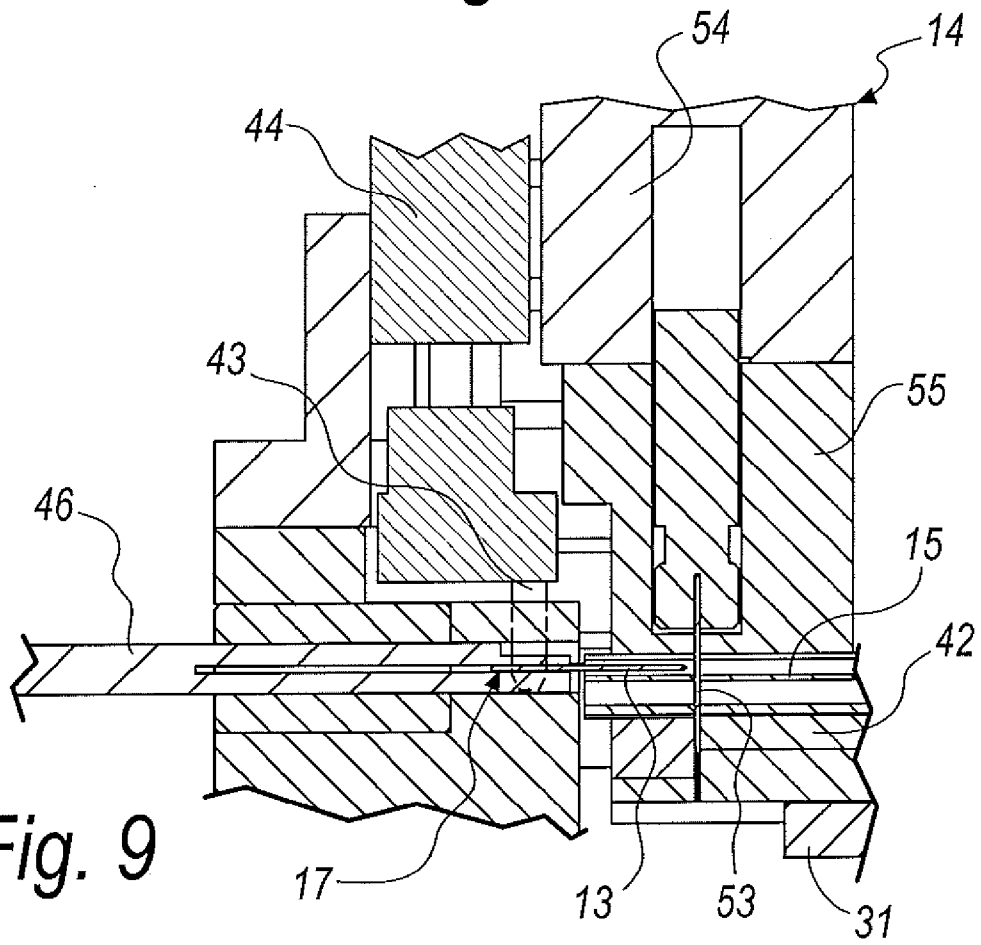
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Fig. 9

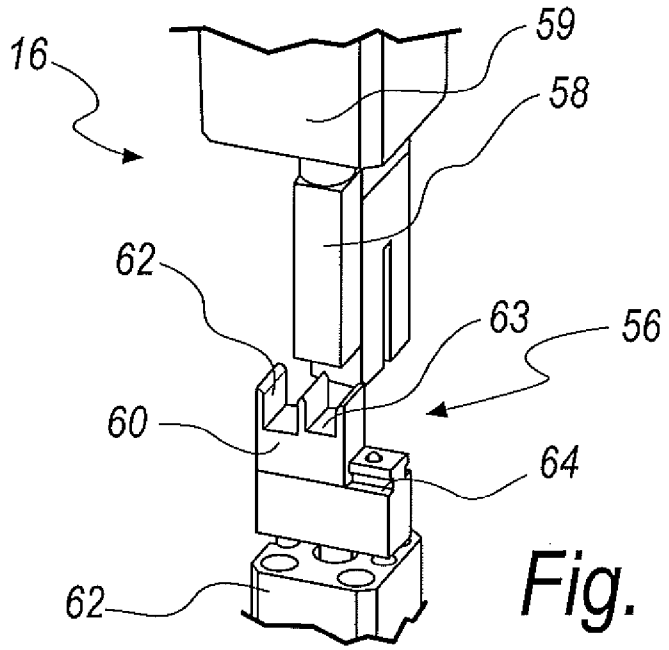
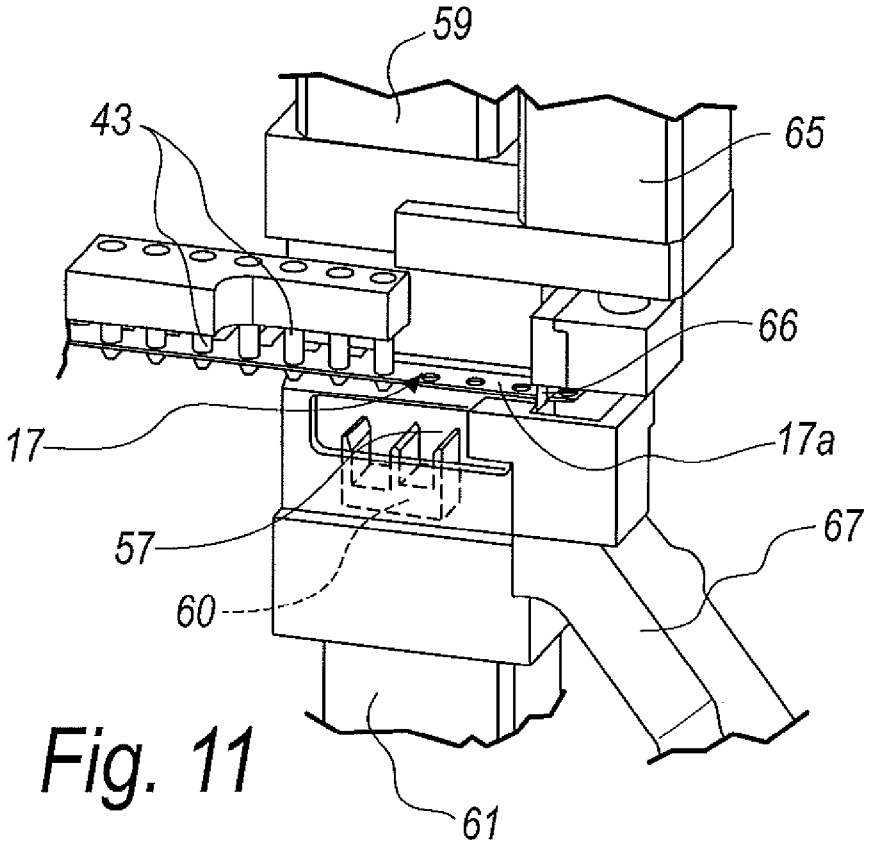


Fig. 10



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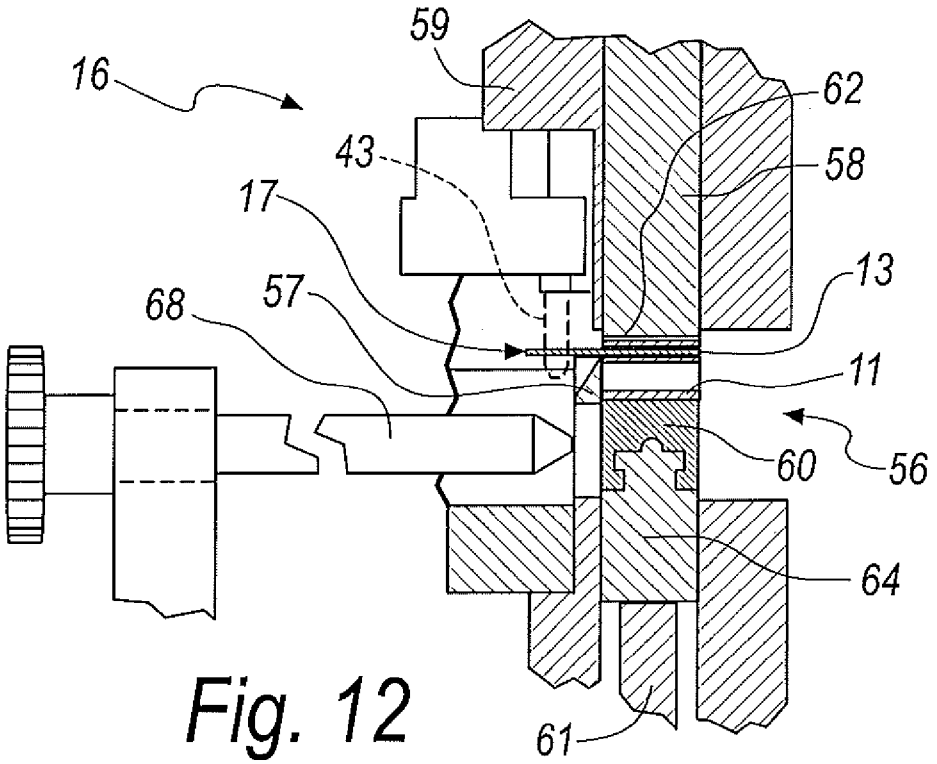
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Fig. 12

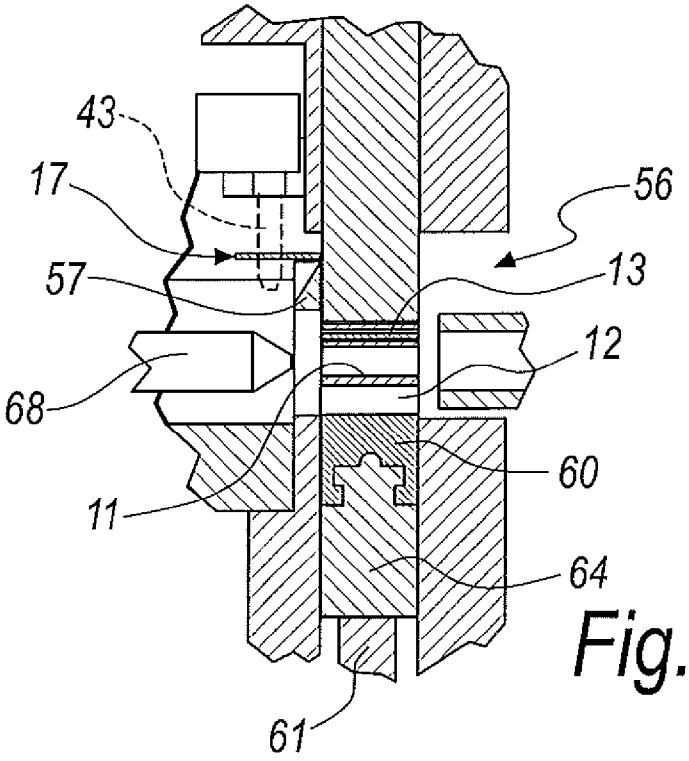
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Fig. 13

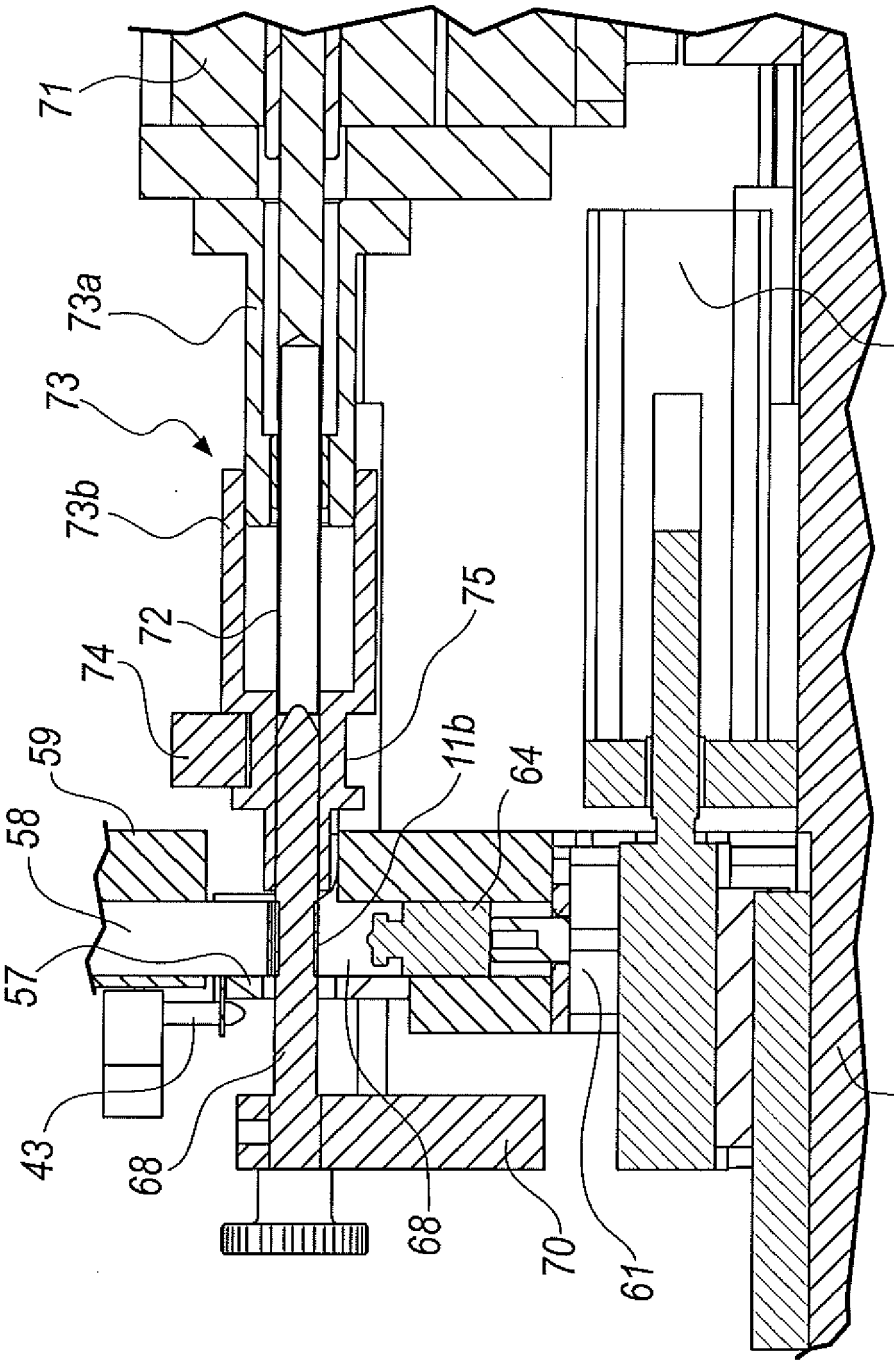

Fig. 14

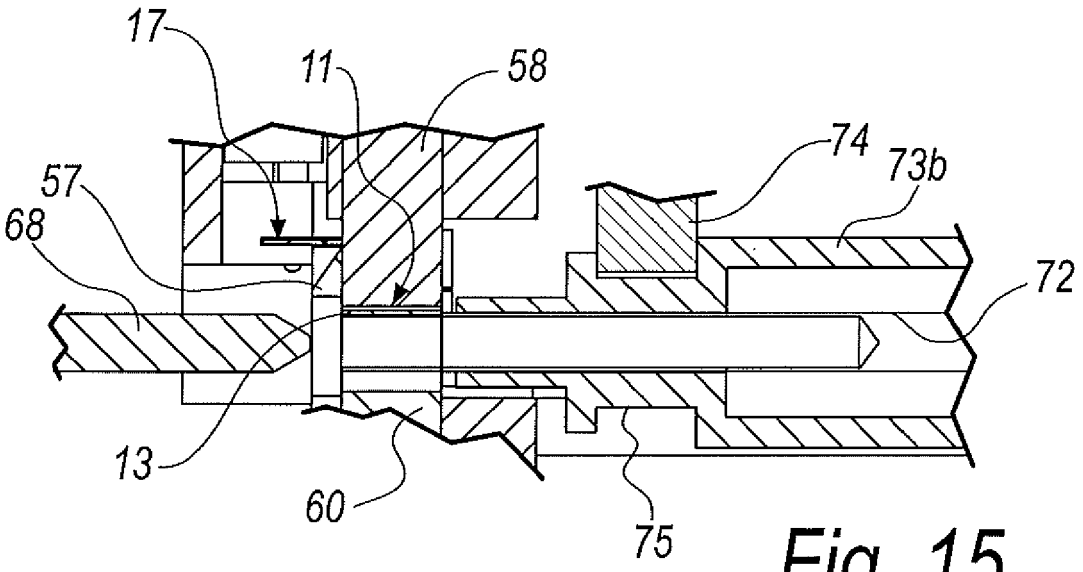
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Fig. 15

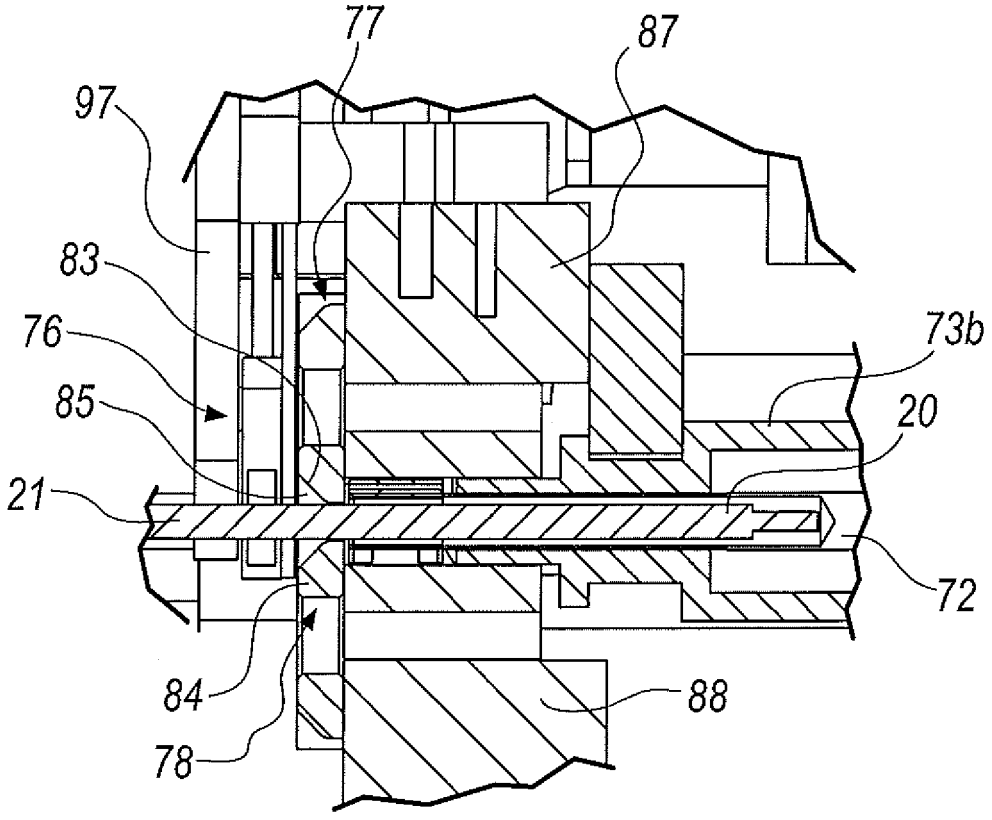
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Fig. 16

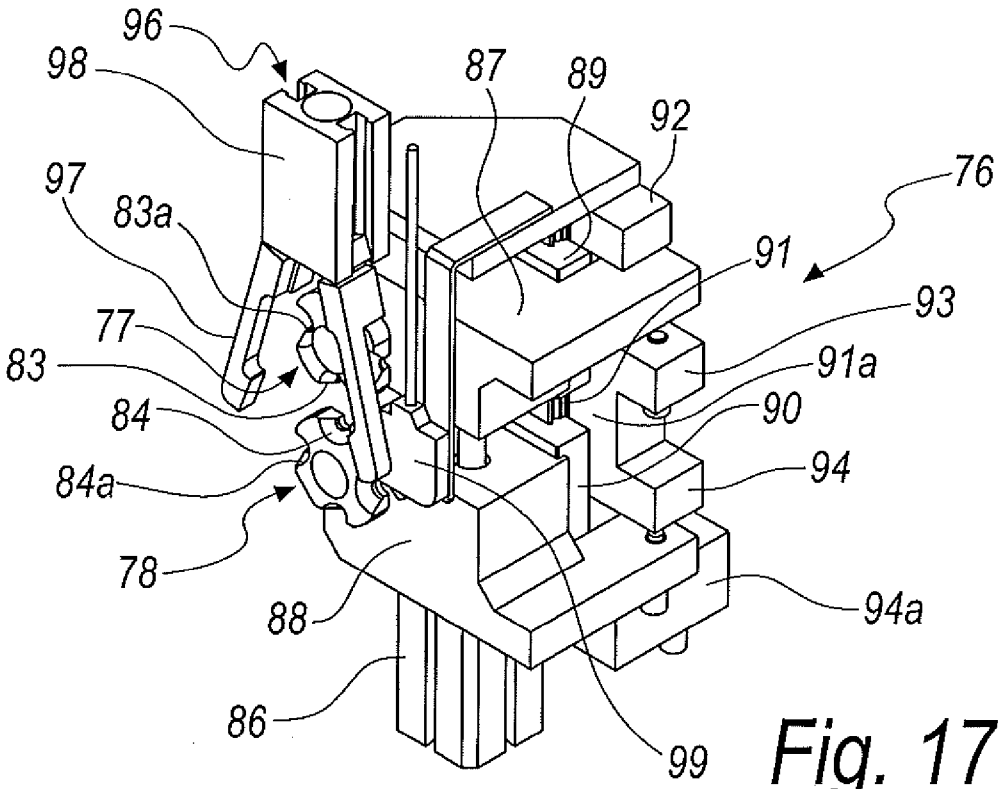
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Fig. 17

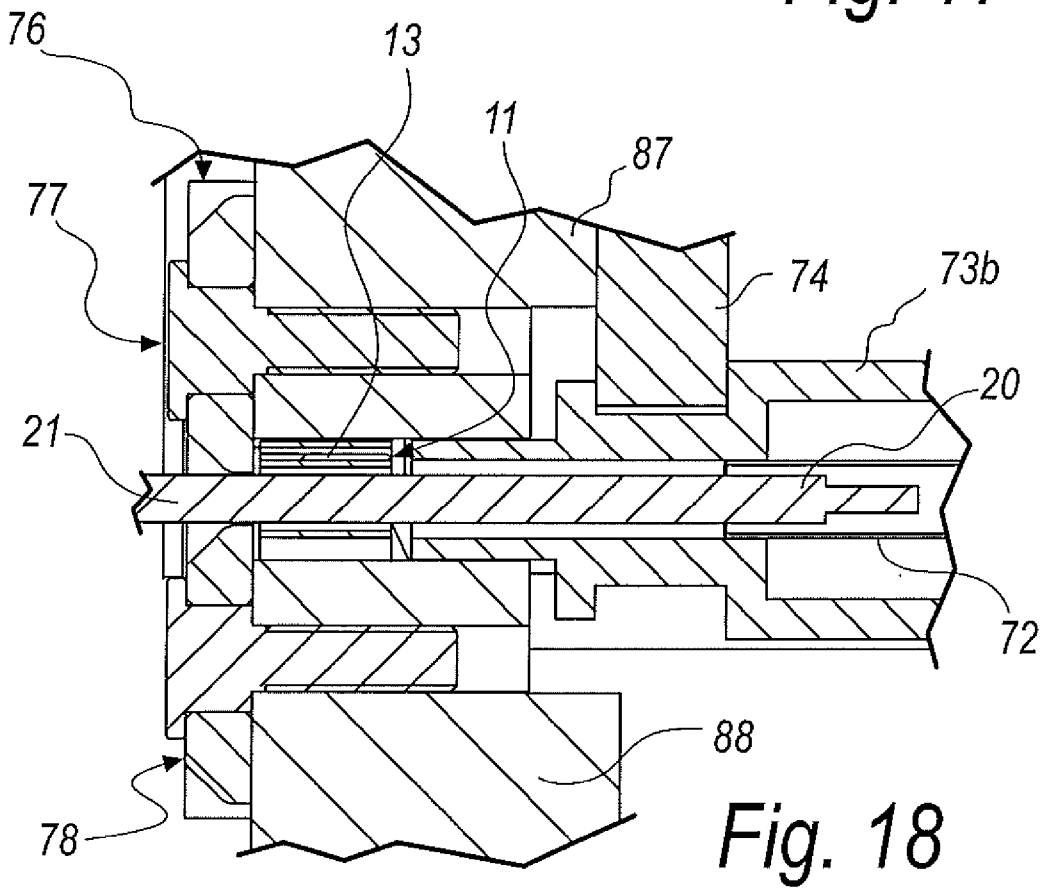
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Fig. 18

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EUROPEAN SEARCH REPORT

Application Number
EP 10 19 1296

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2008/038061 A1 (B A I E DI BRUSA ALESSIO E C S [IT]; BRUSA ALESSIO [IT]) 3 April 2008 (2008-04-03) * page 3, line 24 - page 4, line 6; figure 1 *	1	INV. B65C3/02 H01B13/34
A	EP 0 396 856 A1 (GRAFOPLAST SPA [IT]) 14 November 1990 (1990-11-14) * abstract; figure 1 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65C
H01B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 April 2011	Wartenhorst, Frank

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21-04-2011

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