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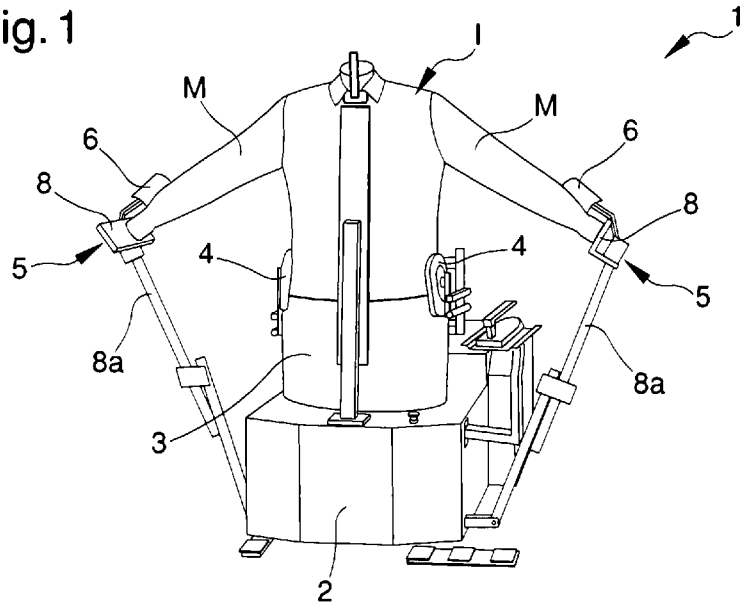
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(54) **Title**: IRONING MACHINE, PARTICULARLY FOR IRONING GARMENTS SUCH AS SHIRTS, JACKETS OR THE LIKE

Fig. 1



(57) **Abstract**: The ironing machine, particularly for ironing garments such as shirts, jackets or the like, comprises a bearing structure, a support element supported by the bearing structure and intended to support a garment with sleeves to be ironed, at least one tensioning element engageable with the free end of a sleeve of the garment and suitable for stretching the sleeve during ironing. The machine comprises a heatable plate with a substantially concave and curved heating surface, which can be moved to come into contact with a substantially end portion of the sleeve, at the height of the vent of the sleeve.

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IRONING MACHINE, PARTICULARLY FOR IRONING GARMENTS SUCH AS SHIRTS, JACKETS OR THE LIKE

Technical Field

This invention relates to an ironing machine, particularly for ironing garments such as shirts, jackets or the like.

Background Art

In the industrial laundry sector, and in the field of industrial ironing generally, the use of professional ironing machines for clothing is known.

With particular reference to the drying and ironing of shirts, work coats, jackets or the like, the use of special machines comprising a support structure for a mannequin of an appropriate shape to adapt to the specific garment and having, on the outer surface, a plurality of holes for the emission of hot air or steam, is known.

The known ironing machines also have special tensioning elements, such as grippers, to grip the sleeves mounted on mobile arms on opposite sides of the mannequin, which are suitable for permitting the correct and complete stretching of the fabric of the garment prior to ironing/drying.

More particularly, the ends of the sleeves of the garment to be ironed are engaged with the respective tensioning elements in order to fully stretch them, so that the portion of the garment placed on the mannequin is as free as possible of folds, in order to assure optimal ironing.

These ironing machines of known type do have some drawbacks.

The above-described known ironing machines, in fact, do not assure the optimal ironing of garments such as shirts, jackets or the like, and more particularly, the ironing of the sleeves on these garments is very complex.

In fact, the ironing of the end portion of the sleeves including the sleeve vent, which is the cut which defines two separate edges to be joined together at the cuff, by buttons, cufflinks or the like in order to assure it adheres to the wrist, is done separately, generally manually.

To iron the sleeve vent, it is therefore necessary to remove the relative garment from the mannequin and proceed manually, e.g. using an iron, to iron each vent separately.

The complexity of these operations clearly leads to long execution times, which consequently translate into high costs due partly to the high incidence of labour and partly to the use of the working equipment for long periods of time.

The known ironing machines however do not only involve long execution times and high costs, but also significant technical difficulty in ironing the sleeves.

In fact, the manual ironing of the sleeves, carried out after the garment is removed from the known ironing machine, generally involves ironing the sleeve vent and the cuff, i.e. the stiff end portion of the sleeve, and this is very difficult.

This difficulty, together with the sometimes lack of skill and attention of the ironing staff, often leads to the poor quality of the ironing.

Disclosure of the Invention

The main aim of this invention is to provide an ironing machine, particularly for ironing garments such as shirts, jackets or the like, which allows to overcome the drawbacks of the known ironing machines and in particular which allows to iron the vent of the sleeves of a garment without having to remove the garment from the ironing machine.

One object of this invention is therefore to drastically simplify, compared to known ironing machines, the overall ironing of a garment, reducing execution times, linked costs and above all improving the quality of the ironing.

Another object of this invention is to provide an ironing machine, particularly for ironing garments such as shirts, jackets or the like, which allows to overcome the drawbacks of the background art within a simple, rational solution that is easy and efficient to use and low in cost.

The above objects are achieved by this ironing machine, particularly for ironing garments such as shirts, jackets or the like, comprising:

- a bearing structure;
- at least one support element supported by said bearing structure and intended to support at least one garment with sleeves to be ironed;
- at least one tensioning element engageable with the free end of a sleeve of said garment and suitable for stretching said sleeve during ironing;

characterised by the fact that it comprises at least one heatable plate with a substantially concave and curved heating surface, which can be moved to come

into contact with a substantially end portion of said sleeve, at the height of the vent of said sleeve.

Brief Description of the Drawings

Other characteristics and advantages of this invention will become more evident from the description of a form of preferred, but not sole, embodiment, of an ironing machine, particularly for ironing the vent of sleeves of garments such as shirts, jackets or the like, illustrated purely as an example but not limited to the annexed drawings in which:

figure 1 is an overall perspective view of the ironing machine according to this invention;

figure 2 is a perspective view of a tensioning element and the relative heatable plate of the ironing machine shown in figure 1;

figure 3 is a front perspective view of the heatable plate and the tensioning element shown in figure 2, the latter engaged with the sleeve of a garment to be ironed;

figure 4 is a front perspective view of the heatable plate and the tensioning element shown in figure 4, the latter being turned 90°;

figure 5 is a perspective view of the heatable plate and the tensioning element shown in figure 5, the heatable plate being in the working configuration;

figure 6 is a front perspective view of the heatable plate and the tensioning element shown in figure 6, the heatable plate being returned to the idle configuration.

Ways of carrying out the Invention

With particular reference to these figures, reference numeral 1 is used to globally indicate an ironing machine according to the invention, which can be used in particular for ironing the vent of sleeves of garments such as shirts, jackets or the like.

It should be noted that in this description, the term "sleeve vent" is used to indicate the cut made in the end portion of the sleeves of a garment, which crosses the cuff and part of the fabric of the relative sleeve, defining two separate edges suitable for being joined together using buttons, cufflinks or the like.

The ironing machine 1 comprises a bearing structure 2 and at least one support element 3 supported by the bearing structure 2 and intended to support at least one garment I to be ironed.

Referring to the particular form of embodiment of the ironing machine 1 illustrated in the figures, the support element 3 extends vertically from the bearing structure 2 and is composed of a mannequin, of the traditional type used for shirt drying and ironing machines, which reproduces the torso of a human figure and which is appropriately shaped to be dressed with the shirt to be dried and ironed.

Other forms of the support element 3 are not however ruled out, which may allow, e.g., the drying and ironing of garments I such as work coats, jackets, coats, overcoats, ladies' dresses, etc.

The support element 3 is associated with a steam or hot air supply circuit, and also has a plurality of emission holes, distributed substantially over the whole outer surface, below a coating in breathable fabric and suitable for emitting the flow of steam or hot air during the ironing and drying of the garment I.

Appropriately, the ironing machine 1 comprises one or more locking elements for locking the torso of the garment I associated with the bearing structure 2, of a known type and generically indicated in figure 1 with reference 4, suitable for permitting the correct stretching of the fabric of garment I prior to drying and ironing. In particular, the locking elements 4 may comprise locking grippers for the rear and front portion of the shirt.

The ironing machine 1 then comprises at least one tensioning element 5 preferably associated with the bearing structure 2, engageable with the free end of a sleeve M of the garment I to fully stretch it.

Advantageously, as shown in figure 1, the ironing machine 1 comprises two tensioning elements 5 arranged on opposite sides of the support element 3 and engageable with each of the sleeves M of the garment I.

According to the invention, the ironing machine 1 comprises at least one heatable plate 6, having a substantially concave and curved heating surface 6a, which can be moved to come into contact with and iron the relative sleeve M at the height of its vent T, when the sleeve M is held by the respective tensioning

element 5.

Appropriately, the ironing machine 1 comprises two heatable plates 6, each of which is suitable for cooperating with a corresponding tensioning element 5 to iron the vent T of both sleeves M of the garment I.

The plates 6 can be heated in various ways known to the technical art, e.g. electrically, or alternatively, by using the steam supply circuit connected to the support element 3 and normally used during ironing.

Advantageously, the heating surface 6a on each plate 6 develops along a relative ironing direction, identified in the figures with the double arrow 7, and is suitable for coming into contact longitudinally with the respective sleeve M.

Advantageously, each tensioning element 5 comprises at least one support element 8, appropriately associated with the bearing structure 2, at least one positioning element 9 integrally associated to the support element 8 and insertable in the relative sleeve M and at least one retaining element 10 of the sleeve.

With particular but not exclusive reference to the form of embodiment of the ironing machine 1 illustrated in the figures, the support element 8 is substantially plate shaped and is associated with the upper end of a substantially vertical arm 8a which, at the lower end, is associated turnable with the bearing structure 2.

The retaining element 10 is associated sliding with the relative support element 8 and is movable, in the approach/moving away direction with respect to the positioning element 9 between at least a release configuration, in which it is moved away from the positioning element, and a grip configuration, in which it is close to the positioning element 9 to hold the sleeve M.

Each support element 8 has a relative elongated slot 18, with which the corresponding retaining element 10 is associated sliding.

More particularly, the positioning element 9 has a first contact surface 9a, which is substantially curved and convex, intended to come into contact with the inside of the relative sleeve M, at the height of the vent T, and the retaining element 10 has a second contact surface 10a, which is substantially curved and concave, suitable for cooperating with the first surface 9a, coming into contact with the

outside of the relative sleeve M at the height of the cuff, in its grip configuration.

Preferably, the first surface 9a develops along a first direction, identified in the figures with the arrow 11, defining a positioning area for resting the vent T of the relative sleeve M.

In the preferred form of embodiment shown in the figures, each of the tensioning elements 5 also comprises an opening element 12 associated sliding with the relative support element 8, insertable in the corresponding sleeve M and movable, in the approach/moving away direction with respect to the positioning element 9 to tighten/widen the sleeve M.

Each opening element 12 is associated sliding with the slot 18 of the relative support element 8.

More particularly, each opening element 12 has a relative third contact surface 12a, which is substantially convex and curved, intended to come into contact with the inside of the relative sleeve M.

The second and third surfaces, respectively 10a and 12a, also develop along a direction which is substantially parallel to the first direction 11, but which are both of a shorter length than that of the first surface 9a.

Advantageously, each plate 6 is movable, in the reciprocal approach/moving away direction with respect to the positioning element 9 of the corresponding tensioning element 5 between at least one idle configuration, in which the plate is moved away from the relative positioning element 9, and a working configuration, in which the plate is close to the relative positioning element 9 and its heating surface 6a cooperates with the corresponding first surface 9a to iron the vent T of the relative sleeve M placed in between the two.

More particularly, the first direction 11 and the ironing direction 7 are substantially parallel to the plate 6 in the working configuration.

Preferably, the ironing machine 1 comprises first movement means 13 of the heatable plates 6.

More particularly, the first movement means 13 comprise, for each plate 6, at least a first fluid dynamic cylinder 14 the stem 14a of which is connected mechanically with the relative plate 6 by a cross bar 15 hinged around a first

rotation axis.

Appropriately, as shown in figure 3, the stem 14a of each first cylinder 14 is associated with an end of the relative cross bar 15 so that its movement causes the rotation of the cross bar around the corresponding first rotation axis.

In the preferred form of embodiment, the support element 8 of each tensioning element 5 is hinged around a relative second rotation axis, which is substantially horizontal in the figures, to vary the orientation of the relative positioning element 9 with respect to the corresponding plate 6, in order to facilitate the insertion of the positioning element inside the relative sleeve M and its later positioning with respect to the corresponding plate 6.

Appropriately, the ironing machine 1 comprises second movement means 16 of each support element 8 around the relative second rotation axis.

More particularly, the second movement means 16 comprise, for each support element 8, at least a second cylinder 17 the stem 17a of which is connected mechanically with the relative support element 8 and exerts on it a torque which causes the rotation around the corresponding second rotation axis.

The operation of the invention is as follows.

Having fitted the garment I on the support element 3, the sleeves M are engaged to the tensioning elements 5.

More particularly, the retaining elements 10 are positioned in their respective release configurations and the relative opening elements 12 in a position which is close to the corresponding positioning element 9 to facilitate the insertion of the latter inside the corresponding sleeve M.

Preferably, the support elements 8 are oriented in such a way that the first surface 9a of the relative positioning elements 9 is turned upwards, as shown in figure 2, in order to facilitate, when inserting the positioning elements inside the relative sleeves M, the positioning of the vents T on the first surfaces.

Having inserted the positioning elements 9 inside the sleeves M with the vents T resting on the relative first surfaces 9a, the retaining elements 10 are moved to the corresponding grip configurations, as shown in figure 4, in order to lock the sleeves M, which therefore remain in the stretched position.

In the same way, the opening elements 12 are moved away from the relative

positioning elements 9 in order to widen the corresponding sleeves M.

Having done this, the second cylinders 17 are made to rotate the relative support elements 8 around the respective second rotation axes, as shown in figure 5.

The support elements 8 are rotated at an angle in which the first surfaces 9a are substantially turned towards the heating surfaces 6a of the relative plates 6, the latter being in their respective idle configurations.

Having defined the position of the positioning elements 9, the plates 6 are moved by turning the first cylinders 14 from their relative idle configurations towards the relative working configurations.

When the plates 6 reach the corresponding working configurations, as shown in figure 6, the relative heating surfaces 6a come into contact with the outside of the respective sleeves M at the height of their vents T and iron them through the cooperation with the relative first surfaces 9a.

Having ironed the vents T of the sleeves M, the plates 6 are then moved away from the positioning elements 9, and then from the sleeves M, and returned to their respective idle configurations, as shown in figure 7.

Now it is possible to remove the garment I from the ironing machine 1 by carrying out the above-described operations in reverse order.

More particularly, the support elements 8 are turned once more around their respective second rotational axes in order to take them back to the starting position, in which it is easier to slide the sleeves M in and out from the corresponding positioning elements 9.

Before sliding the sleeves M out, the retaining elements 10 must be taken back to their corresponding release configurations.

It has in practice been shown how the described invention achieves the proposed objects, and in particular the fact is underlined that it allows the ironing of vents of sleeves of garments such as shirts, jackets or the like, without removing the garment from the ironing machine. This greatly simplifies the ironing operations compared to known ironing machines, with clear and consequent savings of both time and money, and above all assures the precise ironing also of the vents of sleeves, which until now required an additional ironing operation or which were generally ignored given the complexity

involved in the manual execution of this operation.

CLAIMS

1) Ironing machine (1), particularly for ironing garments such as shirts, jackets or the like, comprising:

- a bearing structure (2);
- at least one support element (3) supported by said bearing structure (2) and intended to support at least one garment (I) with sleeves (M) to be ironed;
- at least one tensioning element (5) engageable with the free end of a sleeve (M) of said garment (I) and suitable for stretching said sleeve (M) during ironing;

characterised by the fact that it comprises at least one heatable plate (6) with a substantially concave and curved heating surface (6a), which can be moved to come into contact with a substantially end portion of said sleeve (M), at the height of the vent (T) of said sleeve (M).

2) Ironing machine (1) as claimed in claim 1, characterised by the fact that said heating surface (6a) develops along an ironing direction (7) and is suitable for coming into contact longitudinally with said portion of the sleeve (M).

3) Ironing machine (1) as claimed in claim 1 or 2, characterised by the fact that said tensioning element (5) comprises at least one support element (8) and at least one positioning element (9) integrally associated to said support element (8) and insertable in said sleeve (M).

4) Ironing machine (1) as claimed in claim 3, characterised by the fact that said tensioning element (5) comprises at least one retaining element (10) of the sleeve (M) associated sliding with said support element (8) and movable, in the approach/moving away direction with respect to said positioning element (9) between at least a release configuration, in which it is moved away from said positioning element (9), and a grip configuration, in which it is close to said positioning element (9) to hold said sleeve (M).

5) Ironing machine (1) as claimed in claim 4, characterised by the fact that said positioning element (9) has a first contact surface (9a), which is substantially curved and convex, intended to come into contact with the inside of said sleeve (M).

6) Ironing machine (1) as claimed in claim 5, characterised by the fact that said

retaining element (10) has a second contact surface (10a), which is substantially curved and concave, suitable for cooperating with said first contact surface (9a), coming into contact with the outside of said sleeve (M), in said grip configuration.

7) Ironing machine (1) as claimed in claim 5, characterised by the fact that said first contact surface (9a) develops along a first direction (11) defining a positioning area for resting the vent (T) of said sleeve.

8) Ironing machine (1) as claimed in one or more of claims 3 to 7, characterised by the fact that said heatable plate (6) is movable, in the approach/moving away direction with respect to said positioning element (9) between at least one idle configuration, in which the plate is moved away from said positioning element (9), and a working configuration, in which the plate is close to said positioning element (9) and said heating surface (6a) cooperates with said first contact surface (9a) to iron the vent (T) of said sleeve (M) placed in between the two.

9) Ironing machine (1) as claimed in claim 8, characterised by the fact that said first direction (11) and said ironing direction (7) are substantially parallel to said heating plate (6) in said working configuration.

10) Ironing machine (1) as claimed in claim 8 or 9, characterised by the fact that it comprises first movement means (13) of said heatable plate (6).

11) Ironing machine (1) as claimed in claim 10, characterised by the fact that said first movement means (13) comprise at least a first fluid dynamic cylinder (14) the stem (14a) of which is connected mechanically with said heatable plate (6) by at least a connecting cross bar (15) hinged around a first rotation axis.

12) Ironing machine (1) as claimed in one or more of claims 3 to 11, characterised by the fact that said support element (8) is hinged around a second rotation axis to vary the orientation of said positioning element (9) with respect to said heatable plate (6), in order to facilitate the insertion of the positioning element inside said sleeve (M) and its later positioning with respect to said heatable plate (6).

13) Ironing machine (1) as claimed in claim 12, characterised by the fact that it comprises second movement means (16) of said support element (8) around said

second rotation axis.

14) Ironing machine (1) as claimed in claim 13, characterised by the fact that said second movement means (16) comprise at least a second fluid dynamic cylinder (17) the stem (17a) of which is connected mechanically with said support element (8).

15) Ironing machine (1) as claimed in one or more of claims 3 to 14, characterised by the fact that said tensioning element (5) comprises at least an opening element (12) associated sliding with said support element (8), insertable in said sleeve (M) and movable, in the approach/moving away direction with respect to said positioning element (9) to tighten/widen said sleeve (M).

16) Ironing machine (1) as claimed in claim 15, characterised by the fact that said opening element (12) has a third contact surface (12a), which is substantially convex and curved, intended to come into contact with the inside of said sleeve (M).

17) Ironing machine (1) as claimed in one or more of the previous claims, characterised by the fact that it comprises two of said tensioning elements (5) arranged on opposite sides with respect to said support element (3).

Fig. 1

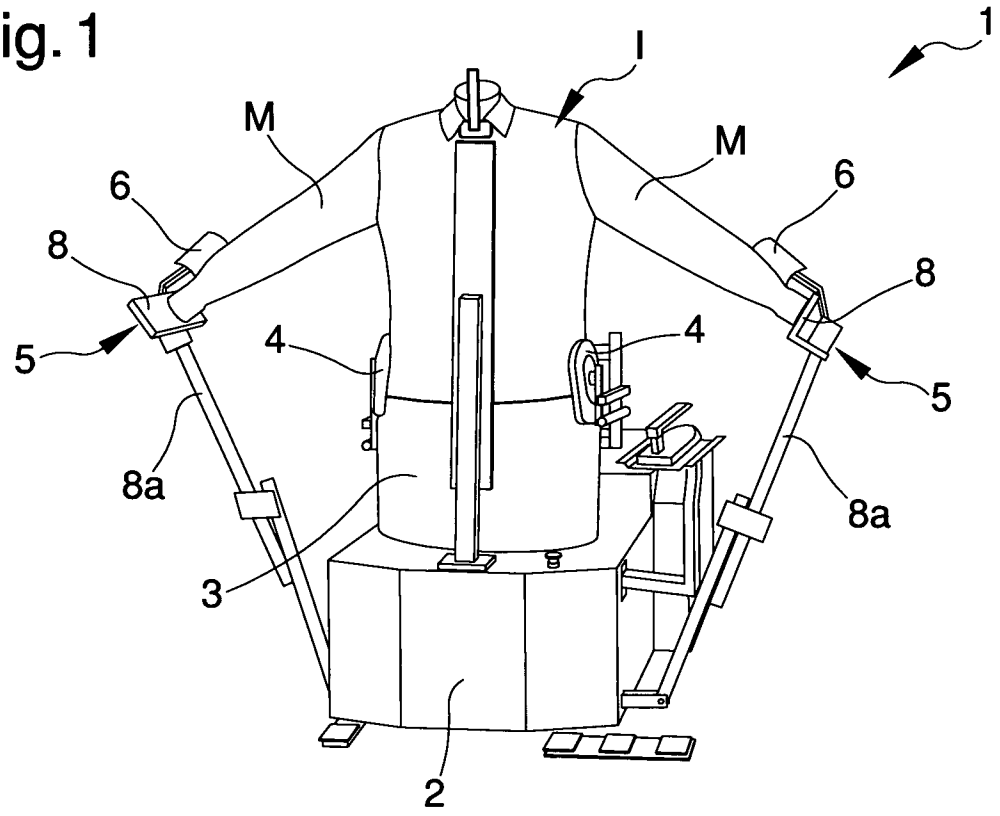

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Fig. 2

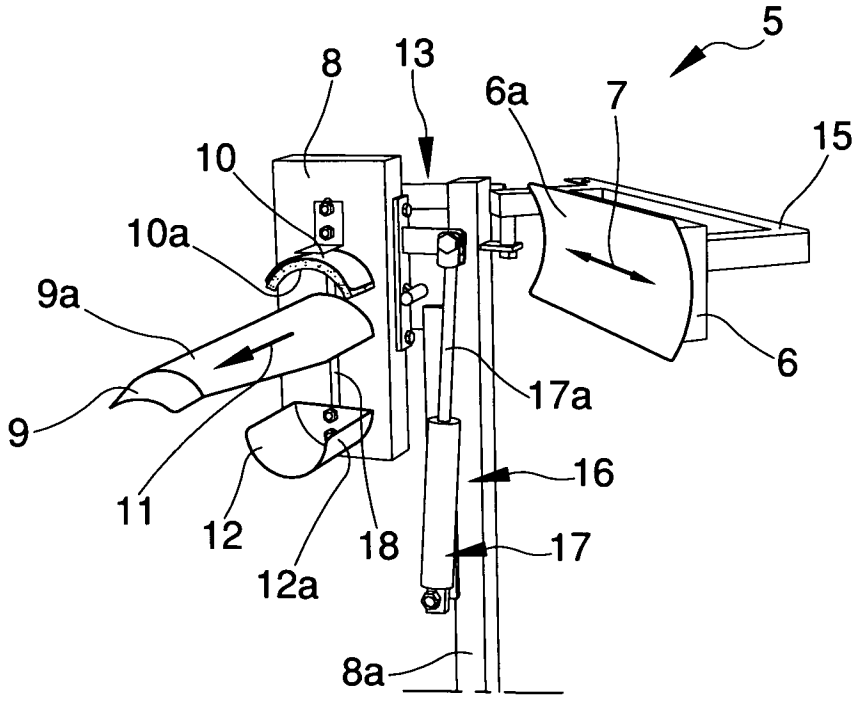
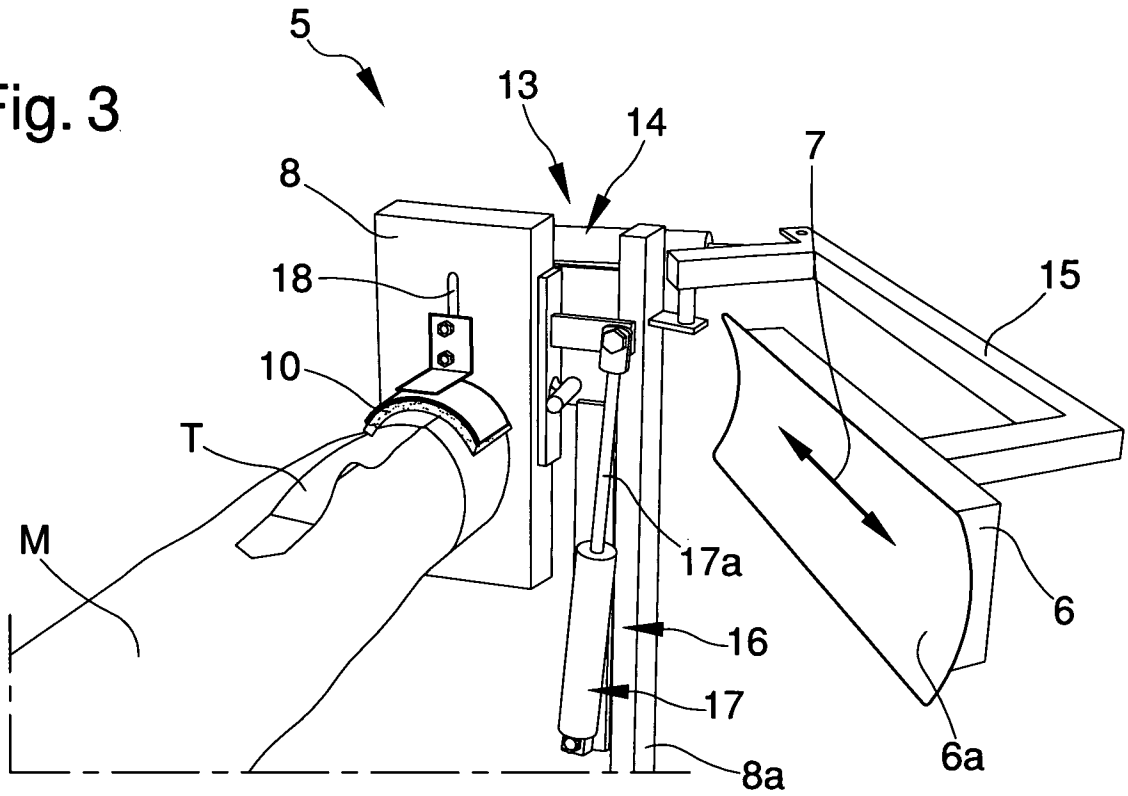

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Fig. 3



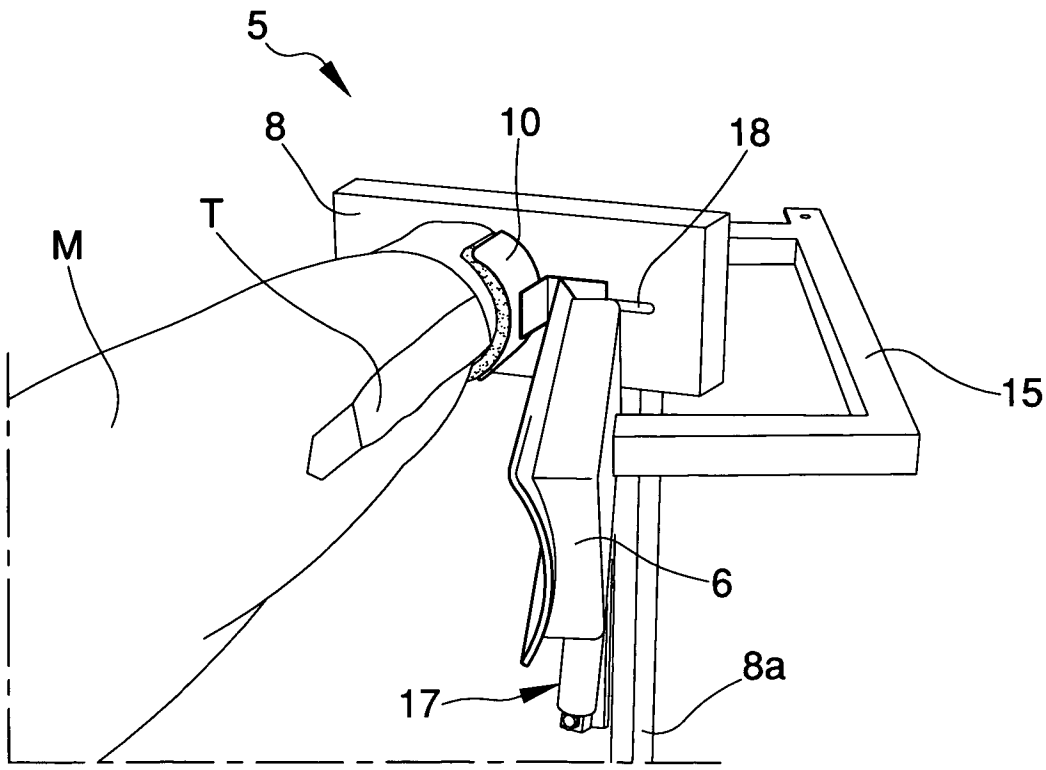


Fig. 4

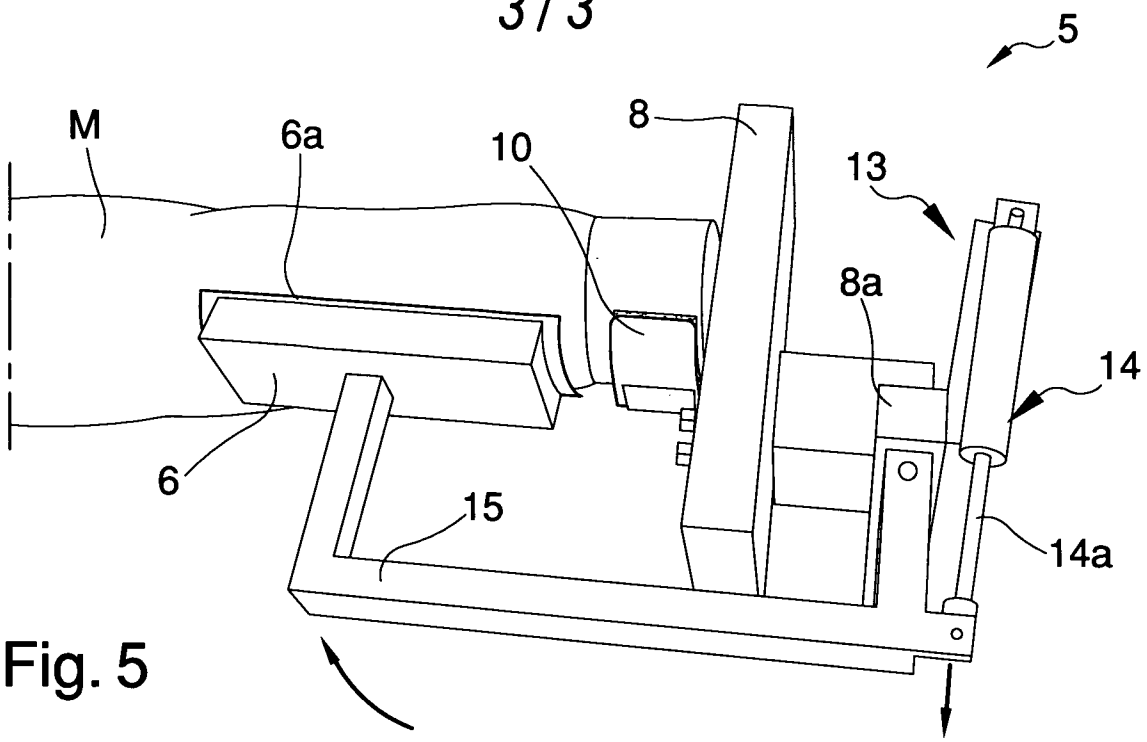


Fig. 5

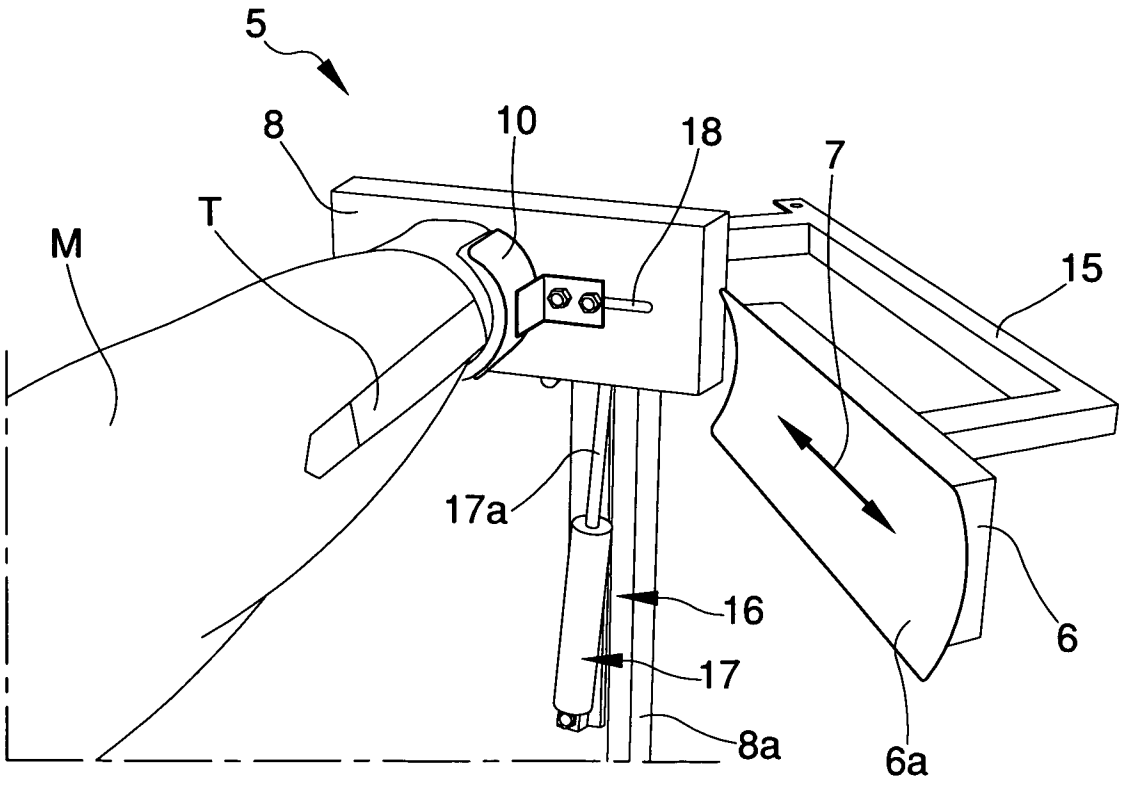


Fig. 6