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(11)

**EP 0 829 570 A2**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:

**18.03.1998 Bulletin 1998/12**(51) Int Cl.<sup>6</sup>: **D06F 69/00**(21) Application number: **97830419.4**(22) Date of filing: **08.08.1997**

(84) Designated Contracting States:

**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**(30) Priority: **23.08.1996 IT FI960201**(71) Applicant: **Fin.Meta S.r.l.****52037 Sansepolcro, Arezzo (IT)**(72) Inventor: **Conti, Cesarino****52037 Sansepolcro, Arezzo (IT)**

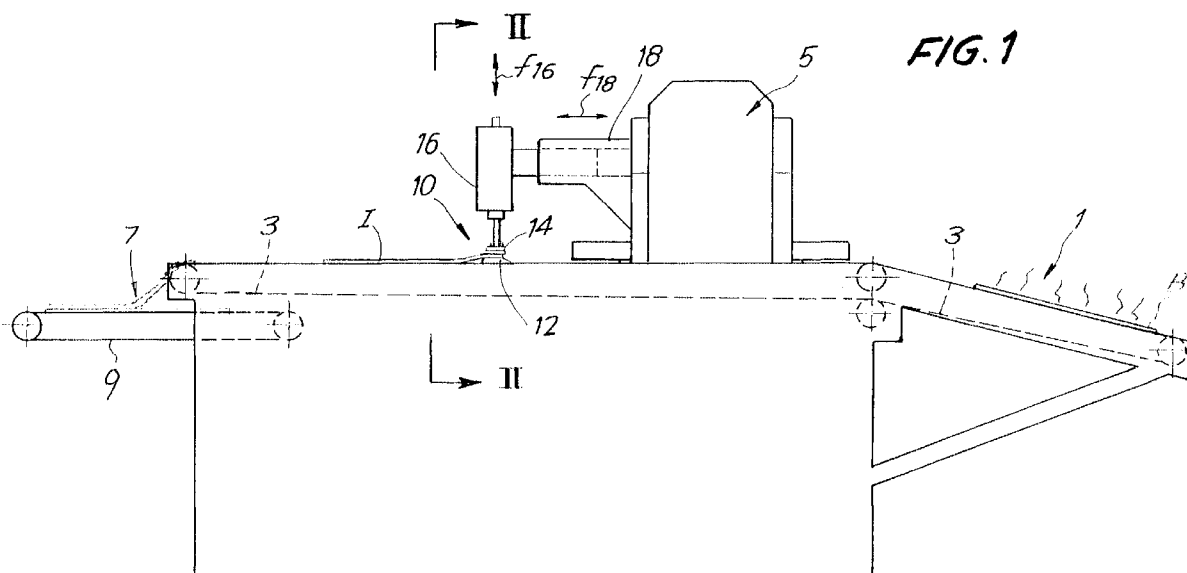
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(54) **Apparatus for processing the end edge of a knitwear article, in pressing machines for knitwear articles and the like**

(57) The pressing machine for garments, in particular woollen knitwear garments or the like, comprises a belt conveying the article in one or more stations towards the unloading point; said machine is provided with at least one station (10) for beating the end edge (B) for

finishing of the article, with beating members (14) and associated actuators (16); means are provided for delivery of air and/or steam opposite the portions to be processed with beating, along a crossbeam (12) located in said station (10).

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## Description

The invention relates to an apparatus, to be associated with pressing machines in general, for finishing the end edge of the article in an automatic manner, practically without any manual intervention.

These and other objects and advantages will become clear from the text which follows.

According to the invention, a pressing machine for garments of any type, for woollen knitwear garments or the like - comprising a conveyor belt for transferring the article from one or more stations, as far as the unloading point - has at least one downstream station for beating the end edge - or similar portions - for finishing of the article, with beating members and associated actuators, with a counter-surface and with means for preliminary processing of the portions to be processed.

Advantageously said beating station is located immediately upstream of the unloading point.

Said beating members in practice are arranged transversely or also parallel with respect to the direction of forward movement of the belt conveying the articles.

Said beating members may comprise at least one rigid element with superficial padding.

The apparatus in question comprises a counter-surface which may be a cross-beam with a shaped receiving cross-section, located underneath or above the conveyor belt or a structure parallel to the movement of the conveyor belt. Said counter-surface accommodates air and/or steam pipes, with delivery nozzles; said beating members are active opposite and along said counter-surface.

Two or two series of beating members operating with phase-displacement, in a same stoppage position or also in successive stoppage positions of the article may also be provided.

At least two successive stoppage positions may also be provided, in at least one of which the air and/or steam delivery means and in the following one at least the beating members are located.

The position of said beating station may be adjusted so as to adapt it to the dimensions of the article of clothing to be processed.

The beating members may be actuated by at least one cylinder/piston actuator, or by a mechanical actuator, for example of the link block type or the like, or electro-mechanical type.

The invention also relates to an additional apparatus to be applied to existing pressing machines, in order to complete them as defined above.

The invention will be better understood with reference to the description and the accompanying drawing which shows a practical non-limiting example of the invention itself. In the drawing:

Fig. 1 shows a very schematic view of a conventional pressing machine equipped with the apparatus in question;

Fig. 2 shows a view substantially from the line II-II of Fig. 1;

Fig. 3 shows in sequence successive stages of operation of the apparatus in question;

Fig. 4 is a schematic plan view;

Fig. 5 shows a solution modified with respect to the previous solution.

According to the diagram of Figs. 1 to 4, 1 denotes a station for the arrangement and/or steam-treatment of the article which is to be pressed. From the station 1, by means of a conveyor belt system schematically shown at 3, the article prepared for pressing is positioned underneath a pressing station, in which a pressing apparatus 5 performs pressing thereof, i.e. flattening and stabilization, in a manner known per se. The conveyor belt 3, after travelling a further distance, reaches an unloading station 7 with an unloading device 9 which receives the articles and stores them or consigns them to other handling equipment.

According to the invention, between the pressing station and the unloading point in the end station 7, at least one additional station 10 is provided for finishing and flattening the so-called bottom end edge B - which usually consists of seamed meshwork - of the garment I to be processed. Normally this edge B is processed by the operator manually with an operation which is long and costly and also particularly difficult, such that specialised labour is needed. The apparatus in question, which completes the pressing machine, may perform this operation of finishing the edge B, avoiding manual intervention.

Substantially in the additional station 10 indicated above there is located a counter-surface - such as a cross-beam 12 according to the drawing - the position of which may also be adjusted both transversely and, in the case of a cross-beam, in the direction of forward movement of the conveyor belt 3, so that the station 10 and hence the counter-surface may be adapted in relation to the dimensions of the article to be processed in each case. The counter-surface 12, and in particular the cross-beam, is shaped with a receiving surface so that the garment I, during transfer onto the conveyor mat 3, is able to overcome the counter-surface or the cross-beam 12, unless said conveyor belt 3, made suitably permeable, is also made to travel over it. Said counter-surface 12 may have extending inside it air pipes for example, and in particular hot air pipes and/or pipes for steam which is usually saturated steam, with suitable nozzles for emitting these fluids so that they are able to strike the layers of the article which are momentarily stopped - or in some cases travelling - over the cross-beam or other counter-surface 12. Suitable control means may be provided for prompt delivery of one and/or other of the fluids which thus envelop the article. The article I is stopped so that the edge B is located opposite the upper shaped surface of the cross-beam or other counter-surface 12, so as to be exposed both to the out-

flow of the abovementioned fluids from the nozzles and so as to be processed with a beating action by means of a beater system which may be single or multiple so as to act simultaneously or in phase-displacement by means of suitably synchronised actuators. In the diagram illustrated, a single beater 14 extends in the form of rigid beam 14A for example made of wood which is suitably reinforced and ribbed and suitably equipped with padding 14A; the beam is actuated upwards and downwards by means of a cylinder/piston actuator 16 which is usually of the pneumatic double-acting type or the like, so as to obtain a successive series of raising and lowering movements in the direction of the double arrow f16 with suitable beating pressure against the fabric of the edge B which is located above the counter-surface 12 in the condition for processing of the article. The actuator 16 is supported by an arm 18 for example from the structure of the pressing unit 5, and the position of said actuator with its beam 14 may be adjusted as indicated by the double arrow f18 in the same direction of translatory movement of the article on the conveyor mat 3, so that the position of this beating station may be adapted in relation to the longitudinal dimensions of the article to be processed in each case.

With this arrangement it is possible to process the edge B of the article when this edge is located opposite the counter-surface 12, performing heating and moistening with the steam and manoeuvring with the air jets which strike the edge and allow movement thereof corresponding to that manually performed by the operator during the manual processing operations carried out hitherto. Beating with the padded beam 14 may be performed with variable frequency and also with variable beating pressures depending on the characteristics of the garment to be processed and the results to be obtained on the edge to be flattened, and suitable means for setting the abovementioned adjustments, via the actuator, will therefore be provided.

The article then follows the normal cycle as far as the unloading station on the unloading and receiving group 9.

It is not excluded that the beating function may also be performed in two different stations both for repetition of the processing operation and for duplication of processing with the vaporising and/or heating fluid and beating.

Fig. 5 shows a possible variation of embodiment in which the beating member 114, instead of being movable vertically, is mounted on an articulated structure with hinges 115 and 116 and with an actuator 118 which causes the angular movements of the beater 114 substantially about the articulation point 116, with a function which is practically equivalent to that of the preceding solution.

A beater member may be made to extend over the entire length of the counter-surface 12 (extending in the same manner as a cross-beam) for simultaneous processing of two articles arranged alongside one another,

and said beater, depending on its extension widthwise, may also be equipped with support and operating structures such as 16 or such as 115, 116, 118, which are suitably duplicated to avoid stresses and deformations as a result of the considerable extension lengthwise of the beater active along a whole leading edge.

The delivery of the fluids from the nozzles of the counter-surface 12 may be suitably split up so as to obtain successive delivery periods and also obtain a slightly irregular moving effect of the edge to be processed, so as to obtain the desired finishing effect for the edge.

It is understood that the drawing shows only an example provided by way of a practical demonstration of the invention, it being possible to vary the forms and arrangements of the invention without thereby departing from the scope of the idea underlying the invention itself.

## Claims

1. Pressing machine for garments, in particular woolen knitwear garments or the like, comprising a belt conveying the article from one or more stations towards the unloading point, characterized in that it comprises at least one station for beating the end edge - or similar portions - for finishing of the article, with beating members and associated actuators, with a counter-surface and with means for preliminary processing of the portions to be processed.
2. Pressing machine according to Claim 1, characterized in that said means for preliminary processing comprise means for delivery of air and/or steam opposite the portions to be processed.
3. Pressing machine according to Claim 1 or 2, characterized in that said beating members are arranged transversely or parallel with respect to the direction of forward movement of the conveyor belt.
4. Pressing machine according to Claim 1 or 2 or 3, characterized in that said beating members comprise at least one rigid element with superficial padding.
5. Pressing machine according to Claim 2, characterized in that it comprises a counter-surface - such as a cross-beam - with a shaped receiving cross-section, which is located underneath or above the conveyor belt and which accommodates air and/or steam pipes, with delivery nozzles, said beating members being active in the position assumed by the portions to be processed.
6. Pressing machine according to at least one of the preceding claims, characterized in that it comprises at least two series of beating members operating with phase-displacement, in a same stoppage position,

sition or in successive stoppage positions of the article.

7. Pressing machine according to at least one of the preceding claims, characterized in that it comprises at least two successive stoppage positions, in at least one of which the air and/or steam delivery means and in the following one at least the beating members are located. 5
8. Pressing machine according to at least one of the preceding claims, characterized in that the position of the beating station may be adjusted. 10
9. Pressing machine according to at least one of Claims 1 to 8, characterized in that the beating members are actuated by at least one cylinder/piston actuator. 15
10. Pressing machine according to at least one of Claims 1 to 8, characterized in that the beating members are operated by at least one mechanical actuator of the link block type or the like. 20
11. A complementary apparatus, also to be applied to existing pressing machines, characterized in that it is designed to complete the machine according to at least one of the preceding claims. 25

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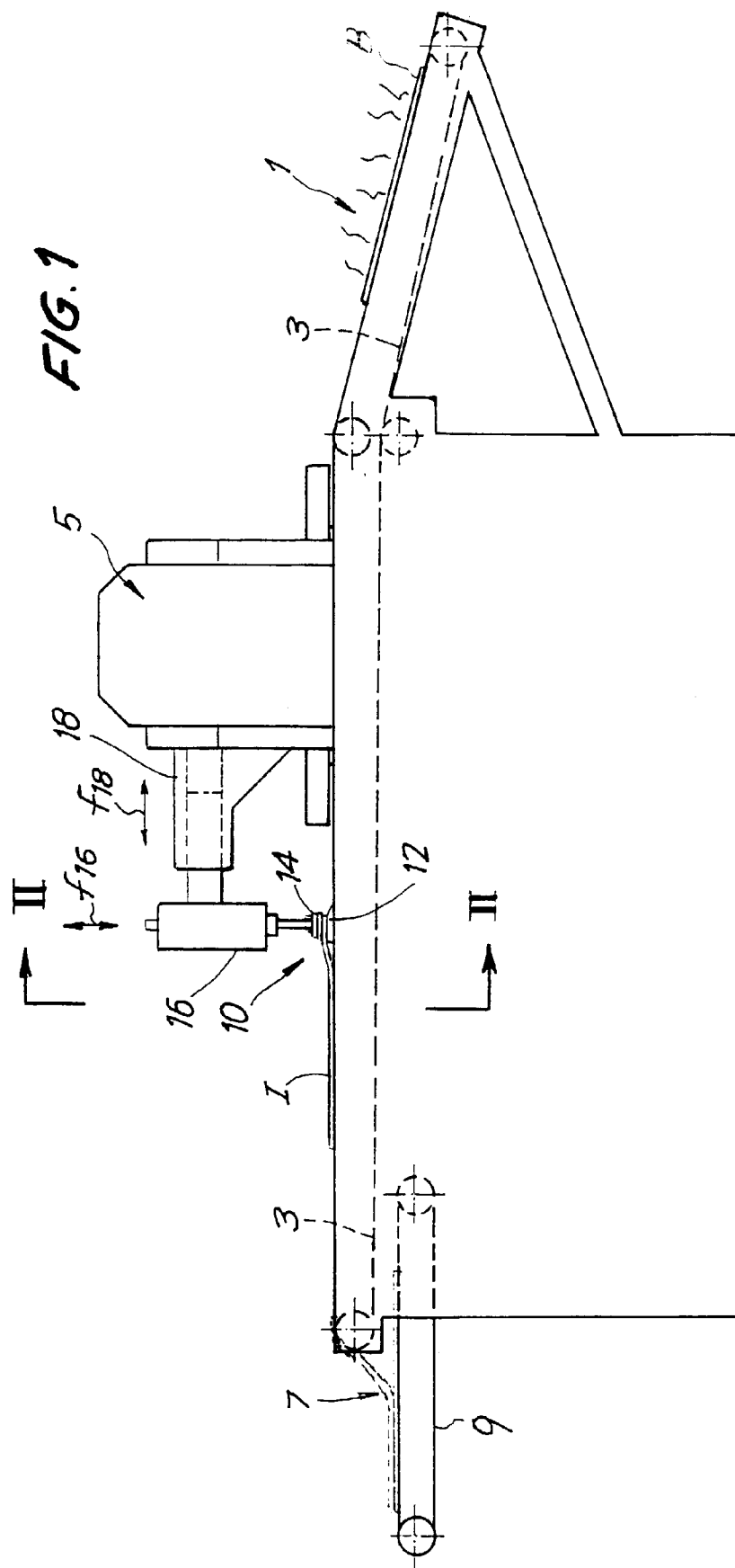
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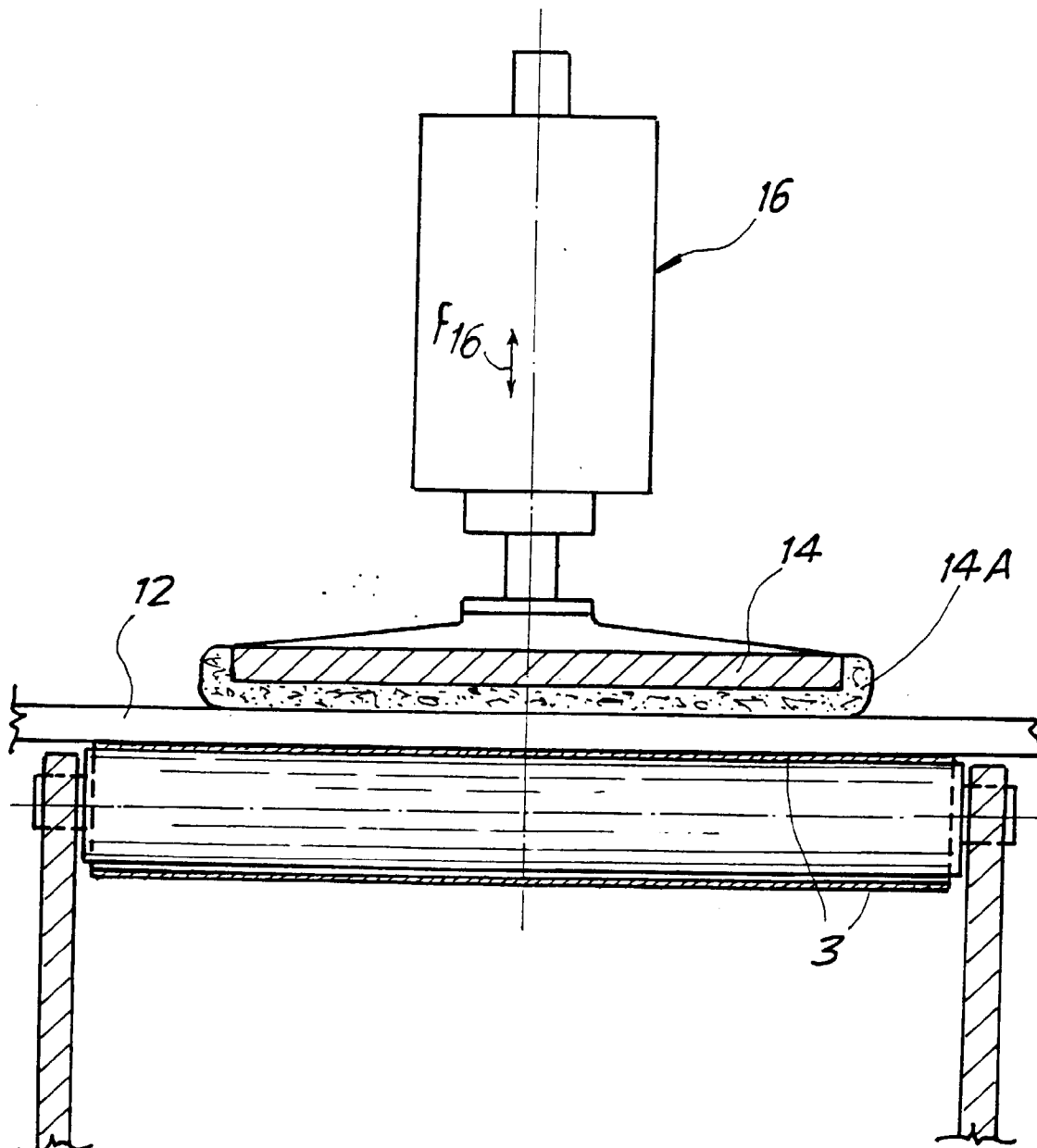
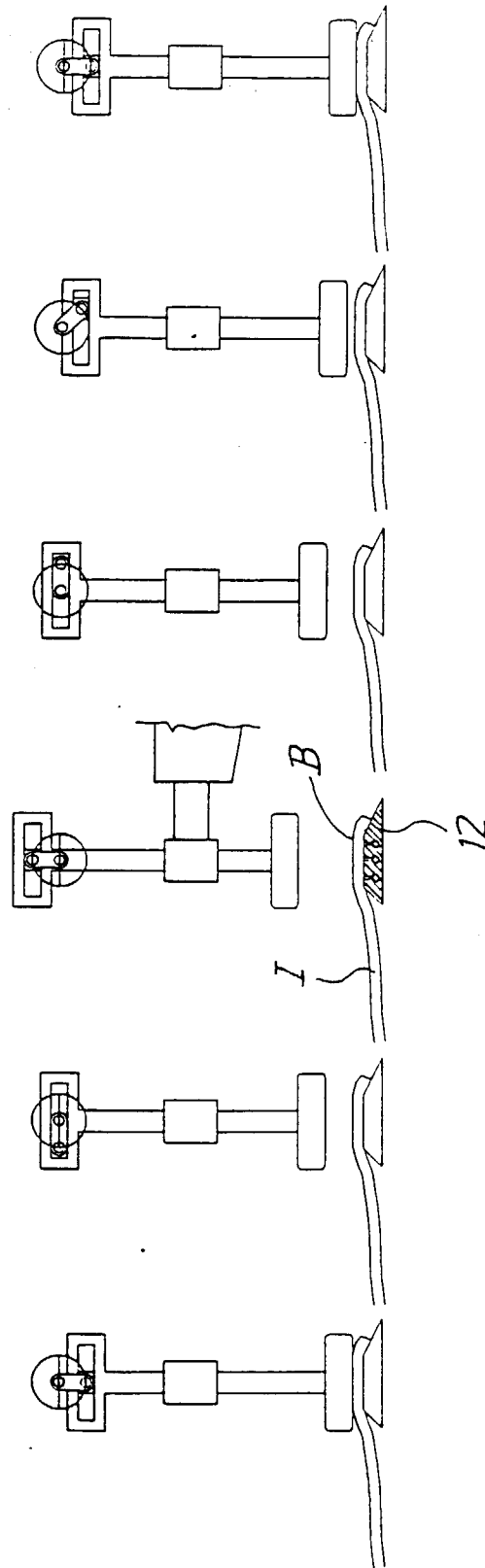
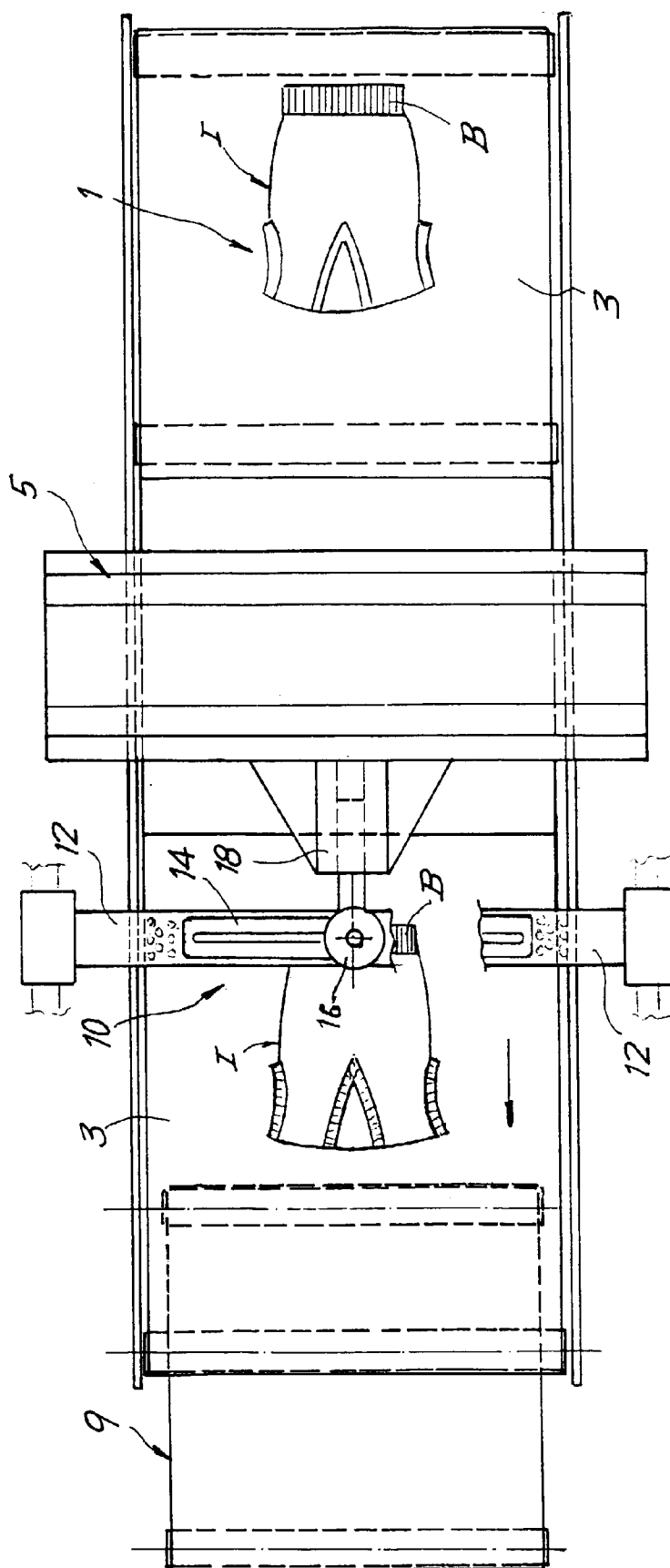


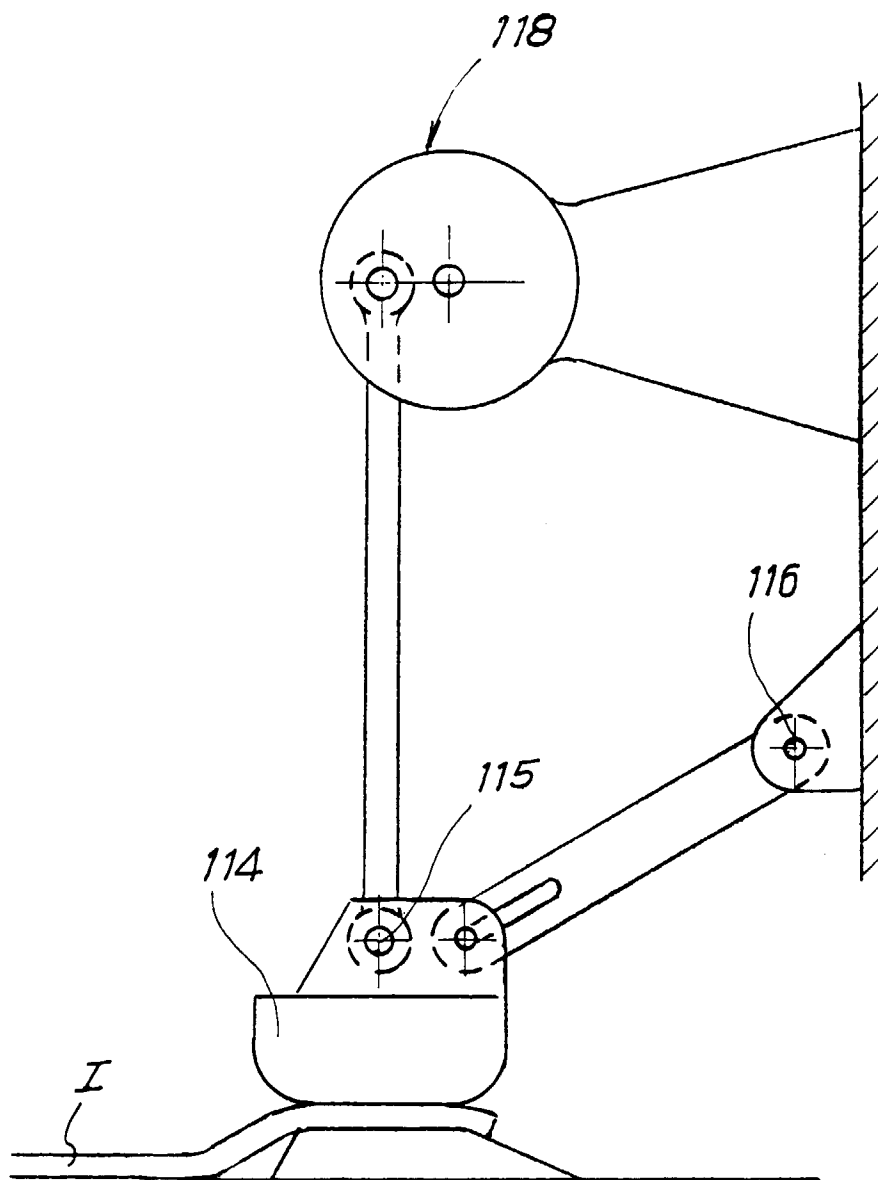
FIG. 2

FIG. 3





**FIG. 4**



**FIG. 5**