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(54) **Machine for a shoemaking operation, especially for fixing the upper to the insole**

Schuhherstellungsmaschine, insbesondere zur Verbindung von einem Schaft mit einer Brandsohle

Machine de fabrication de chaussures, en particulier pour relier la tige avec la semelle intérieure

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EP-A- 0 269 333 **EP-A- 0 340 390**
EP-A- 0 512 526 **GB-A- 2 249 707**

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Description

[0001] The present invention relates to a machine for a shoemaking operation, especially for fixing the upper to the insole.

[0002] Known machines of this kind usually include support means on which to position a shoemaker's last to which is attached the insole and over which is laid the upper, means for gripping and stretching the upper, means for clamping the last on said support means, and means for folding the upper onto the insole in order to fix the upper to the insole.

[0003] GB-A-2 249 707 (upon which the preamble of claim 1 is based) discloses an improved mechanisms for toe-lasting machine wherein heel press block and pressing means which press down on a toe portion of an upper are actuatable simultaneously.

[0004] EP-A-0 269 333 discloses a system to perform operations on footwear upper assemblies, which includes a transfer mechanism to acquire a shoe upper assembly from a first shoe machine to a second shoe machine in a sequential operation, the upper assembly being reoriented and indexed automatically for operation thereon by the second machine.

[0005] EP-A-340 390 discloses a shoemaking set-up comprising, in particular, a first conveyor for removing a last from a conveyor for pallets, on each of which a last can be fixed, to a toe lasting machine and second transport device which, after removal from the last of the shoe shaft, toe lasting and heel and side lasting, removes by manual handling the toe-lasted, side-lasted and heel-lasted shoe unit from the heel and side lasting machine, places it positionally correctly on the pallet again and fixes it there.

[0006] Normally the operator positions the last with the upper and the insole on the support means and then operates the machine in such a way that the grasping means grip and stretch the upper, the clamp means clamp the last on the support means, and the folding means fold the upper onto the insole, to which glue has been applied by suitable devices, so fixing the upper to the insole by adhesive bonding. At the end of the operating cycle, the last with the upper glued to the insole is released from the abovementioned grasping, clamping and folding means and drops into a suitable receptacle positioned near the support means. The operator then positions a new last with insole and upper on the support means and recommences the operating cycle. During this new operation the operator removes the previous last from the receptacle and passes it on for the succeeding operations. The process continues in this way, the lasts being used one after the other.

[0007] However, this method of working has many drawbacks.

[0008] In the first place, when the operator takes the previous last from the receptacle his hands are close to the mechanical parts of the machine that are carrying out the above functions, and therefore there is a high

risk of an accident if he is distracted.

[0009] Furthermore the operator is losing time in taking the previous last and passing it on for the next operation and may even not be ready to position a new last on the support means. This is obviously to the detriment of productivity.

[0010] Lastly, for whatever reason, the operator may not remove the last from the receptacle during each new operating cycle, in which case the following last, on falling into the receptacle, may strike the previous last at some speed sufficient to cause damage to the uppers mounted on the lasts.

[0011] It is an object of the present invention to overcome the drawbacks enumerated above.

[0012] This object is achieved with a machine according to claims 1. Further embodiments are disclosed in dependent claims 2-11.

[0013] To enable the invention to be understood more clearly, a description will now be provided of a nonlimiting example of an embodiment thereof, illustrated in the accompanying drawings in which:

Fig. 1 is a perspective view of a machine for a shoemaking operation according to the invention, illustrated in its fundamental elements;

Fig. 2 shows the machine of Fig. 1 accompanied by a movable container;

Figs. 3 and 4 show the machine of Fig. 1 accompanied by other means of conveyance.

[0014] The machine for a shoemaking operation shown in Fig. 1, denoted as a whole by the numeral 10, is designed to adhesively bond the front part of the upper to the insole, thus carrying out one of the operations that lead to the finished item of footwear. For this operation a last A is used to which the insole B is attached and over which the upper C is laid.

[0015] The machine 10 includes: a support 11 for the front part of the last A; a series of grips 12 controlled by actuators for gripping and stretching the upper C; a front pad 13 (illustrated in Fig. 1 only), a resilient front half collar 14 and a rear pad 15, all controlled by individual actuators and movable in the directions indicated by the arrows in order to clamp the last A on the support 11; and plates 16, also controlled by individual actuators, in order to fold the upper C onto the insole B.

[0016] All the components listed above are known per se and are not therefore described in detail here.

[0017] The machine 10 also includes devices which apply the glue to the front part of the insole B, being arranged in the vicinity of the support 11, but not visible in the figures. These devices will not be further described as they are of known type.

[0018] Lower down, below the support 11, is a conveyor belt 17 connected to the support 11 by a sloping wall 18. The conveyor belt 17 is driven by a motor 19 controlled by a central electronic control means 20, the last two items being shown in Fig. 1 only. There are also

containment walls 21 along the sides of both the conveyor belt 17 and the sloping wall 18 and against the tail end of the conveyor belt.

[0019] The machine 10 thus described and illustrated operates as follows.

[0020] The operator positions the last A with the insole B and the upper C on the support 11 and then operates the machine so that the grips 12 grip and stretch the upper C, the pads 13, 15 and the half collar 14 clamp the last A on the support 11, and the plates 16 fold the upper C onto the insole B to which glue has been applied by the appropriate devices, in such a way as adhesively to bond the upper C to the insole B.

[0021] When the operating cycle has been completed, the last A with the upper C bonded to the insole B is released from the grips 12, from the pads 13, 15, from the collar 14, and from the plates 16, and drops onto the sloping wall 18 where it slides under gravity down onto the conveyor belt 17, which then carries the used last A away from the machine 10 and on to the next operation.

[0022] As shown in Fig. 2, at the end of the conveyor belt 17 it is possible to provide a wheeled container 22 into which the lasts used by the machine 10 drop. When filled, the container is moved manually to take the lasts to the location of the next operation.

[0023] Alternatively, as shown in Fig. 3, the conveyor belt 17 can be connected at an angle to another conveyor belt 23 which likewise is provided both with lateral containment walls 24 and with a containment wall for the tail end, which wall is a continuation of the wall 21. In this way the used lasts are passed automatically to the location of the next operation.

[0024] As in Fig. 3, Fig. 4 illustrates another conveyor belt 25 with lateral containment walls 26. In this case the connection between the conveyor belt 17 and the conveyor belt 25 is a "T" junction and the belt 25 is intended to collect the used lasts from a plurality of shoemaking machines such as the machine 10 working in parallel, and transferring them to the location of the next operation.

[0025] All the containment walls described above and illustrated enable the used lasts to be conveyed as desired along the intended path and prevent the lasts from falling off the edges.

[0026] The central control means 20 may cause the motor 19 to drive the conveyor belt 17 continuously. Alternatively the central control means 20 may cause the motor, and hence the conveyor belt, to run intermittently, synchronizing them with the other movements of the machine. If the conveyor belt 17 is connected to another conveyor belt, as in Figs. 3, 4, the central control means may synchronize the movement of the conveyor belt 17 with the movement of the other conveyor belt too.

[0027] The machine 10 herein described and illustrated has many advantages which overcome the problems discussed in the introduction, owing to the fact that the operator is no longer required to pick up the already used last and move it so as to direct it towards the next

operation, since this is done automatically.

[0028] The operator therefore no longer needs to be close to the mechanical parts of the machine while they are working, nor is he distracted by the task of picking up and moving the already used last. There is thus no risk of his having an accident.

[0029] Furthermore, the operator does not lose time in picking up and moving the used last, but simply gets ready to position the new last, thereby cutting out unproductive time and so increasing his productivity.

[0030] Lastly, it is impossible for a used last following a previous one to strike it because the used last is carried away immediately.

[0031] It should be emphasized that all these advantages are achieved by simple, economical and reliable means.

[0032] It will be clear that variants and/or additions to that which has been described and illustrated are possible.

[0033] The sloping wall, the conveyor belt and the containment walls may be replaced by equivalent transferring and conveying means. The conveyor belt in particular can be replaced with a functionally equivalent conveyor. Moreover, the path defined by the conveyor need not be straight but could, for example, be curved or otherwise shaped.

[0034] The various components of the machine can also be replaced by functionally equivalent components.

[0035] Instead of having a movable container or another conveyor belt, the machine can be provided with a robot that identifies, picks up and passes to the location of the next operation the lasts carried away by the conveyor belt. The central control means will in this case synchronize the movement of the conveyor belt not only with the movements of the machine but also with the movements of the robot.

Claims

1. Machine for a shoemaking operation, especially for fixing the upper to the insole, including support means (11) on which to position a shoemaker's last (A) to which is attached the insole (B) and over which is laid the upper (C), means (12) for gripping and stretching the upper (C), means (13, 14, 15) for clamping the last (A) on said support means (11), and means (16) for folding the upper (C) onto the insole (B) in order to fix the upper to the insole, which machine is characterized in that it also comprises transferring and conveying means which includes a conveyor belt (17) underneath said support means (11), into which the last (A) with the upper (C) and the insole (B) is discharged under gravity after being released from said grasping, clamping and folding means (12-16) and by which the last (A) with the upper (C) and the insole (B) is passed on towards the next operation, wherein

the conveyor belt (17) is connected to the support means (11) by a sloping wall (18) down which the released last (A) with the upper (C) and the insole (B) slides onto the conveyor belt (17), and/or said conveyor belt is provided with containment walls (21) along the sides and against the tail end of said conveyor belt (17).

2. Machine according to Claim 1, in which containment walls (21) are provided along the sides of both the conveyor belt (17) and of the sloping wall (18) and against the tail end of the conveyor belt (17).
3. Machine according to any one of Claims 1, 2, in which at the head end of the conveyor belt (17) a wheeled container (22) is provided manually that can be moved to the location of the next operation, into which the lasts (A) drop after being used.
4. Machine according to any one of Claims 1, 2, in which the conveyor belt (17) is connected to another conveyor belt (23; 25) provided with containment walls (24; 26) for passing the lasts (A) with the upper (C) and the insole (B) automatically to the location of the next operation.
5. Machine according to Claim 4, in which the conveyor belt (17) is connected at an angle to said other conveyor belt (23).
6. Machine according to Claim 4, in which the conveyor belt (17) is connected in a "T" junction to said other conveyor belt (25).
7. Machine according to any one of Claims 1, 2, in which the conveyor belt (17) is driven by a motor (19) controlled by a central control means (20) synchronized with the other movements of the machine.
8. Machine according to Claim 7, in which the central control means (20) controls the motor (19) intermittently to suit the movements of the machine.
9. Machine according to any one of Claims 4, 5, 6, in which the conveyor belt (17) is driven by a motor (19), controlled by a central control means (20) synchronized with the other movements of the machine and with the movement of said other conveyor belt (23; 25).
10. Machine according to any one of Claims 1, 2, provided with a robot that identifies, picks up and passes to the location of the next operation the lasts carried away by the conveyor belt (17).
11. Machine according to Claim 10, in which the conveyor belt (17) is driven by a motor (19) controlled

by a central control means (20) synchronized with the other movements of the machine and with the movements of the robot.

Patentansprüche

1. Maschine für einen Schuhherstellungsarbeitsgang, insbesondere zur Befestigung des Schafts an der Brandsohle, mit

- einer Unterlage (11), auf der ein Leisten (A), an dem die Brandsohle (B) angebracht und auf den der Schaft (C) gelegt ist, positioniert wird,
- einer Einrichtung (12), die den Schaft (C) greift und spannt,
- Einrichtungen (13, 14, 15), die den Leisten (A) auf der Unterlage (11) festklemmen, sowie
- einer Einrichtung (16), die den Schaft (C) auf die Brandsohle (B) umklappt, um den Schaft (C) an der Brandsohle (B) zu befestigen,

dadurch gekennzeichnet,

dass diese Maschine weiterhin unterhalb der Unterlage (11) ein Förderband (17) umfassende Übergabe- und Fördereinrichtungen aufweist, in die der Leisten (A) samt Schaft (C) und Brandsohle (B) fallen gelassen wird, nachdem er von den Greif-, Festklemm- und Umklappeinrichtungen (12 - 16) gelöst wurde, und von denen der Leisten (A) samt Schaft (C) und Brandsohle (B) zum nächsten Arbeitsgang transportiert wird, wobei das Förderband (17) durch eine geneigte Wand (18), auf der der gelöste Leisten (A) samt Schaft (C) und Brandsohle (B) auf das Förderband (17) hinab gleitet, mit der Unterlage (11) verbunden ist und/oder das Förderband (17) an den Seiten und am hinteren Umlaufende mit Rückhaltewänden (21) versehen ist.

2. Maschine nach Anspruch 1, bei der an den Seiten des Förderbands (17) und der geneigten Wand (18) sowie am hinteren Umlaufende des Förderbands (17) Rückhaltewände (21) vorgesehen sind.
3. Maschine nach Anspruch 1 oder 2, bei der am Kopfende des Förderbands (17) ein fahrbarer Behälter (22) aufgestellt wird, in den die verwendeten Leisten (A) fallen und der zum Ort des nächsten Arbeitsgangs bewegt werden kann.
4. Maschine nach Anspruch 1 oder 2, bei der das Förderband (17) mit einem weiteren mit Rückhaltewänden (24; 26) versehenen Förderband (23; 25) verbunden ist, um die Leisten (A) samt Schaft (C) und Brandsohle (B) automatisch zum Ort des nächsten Arbeitsgangs zu transportieren.
5. Maschine nach Anspruch 4, bei der das Förderband

(17) in einem Winkel mit dem anderen Förderband (23) verbunden ist.

6. Maschine nach Anspruch 4, bei der das Förderband (17) T-förmig mit dem anderen Förderband (25) verbunden ist. 5
7. Maschine nach Anspruch 1 oder 2, bei der das Förderband (17) von einem von einer zentralen Steuereinrichtung (20) gesteuerten Motor (19) synchron zu den anderen Bewegungen der Maschine angetrieben wird. 10
8. Maschine nach Anspruch 7, bei der die zentrale Steuereinrichtung (20) den Motor (19) entsprechend den Bewegungen der Maschine intermittierend steuert. 15
9. Maschine nach einem der Ansprüche 4, 5 oder 6, bei der das Förderband (17) von einem von einer zentralen Steuereinrichtung (20) gesteuerten Motor (19) synchron zu den anderen Bewegungen der Maschine und zur Bewegung des anderen Förderbands (23; 25) angetrieben wird. 20
10. Maschine nach Anspruch 1 oder 2, die mit einem Roboter ausgestattet ist, der die vom Förderband (17) abtransportierten Leisten (A) identifiziert, aufnimmt und zum Ort des nächsten Arbeitsgangs transportiert. 25
11. Maschine nach Anspruch 10, bei der das Förderband (17) von einem von einer zentralen Steuereinrichtung (20) gesteuerten Motor (19) synchron zu den anderen Bewegungen der Maschine und den Bewegungen des Roboters angetrieben wird. 30

Revendications

1. Machine pour mettre en oeuvre une opération de fabrication de chaussures, en particulier pour fixer la tige à la première, incluant des moyens (11) de support pour y positionner un embauchoir (A) de fabricant de chaussures auquel la première (B) est fixée et sur lequel la tige (C) est disposée, des moyens (12) pour saisir et tendre la tige (C), des moyens (13, 14, 15) pour bloquer l'embauchoir (A) sur lesdits moyens (11) de support, et des moyens (16) pour plier la tige (C) sur la première (B) afin de fixer la tige à la première, laquelle machine est caractérisée en ce qu'elle comprend également des moyens de convoyage et de transfert qui incluent une courroie de convoyeur (17) sous lesdits moyens (11) de support, dans laquelle l'embauchoir (A) avec la tige (C) et la première (B) est déchargé sous l'action de la gravité après avoir été libéré desdits moyens de saisie, de blocage et de pliage (12 40

à 16) et par laquelle l'embauchoir (A) avec la tige (C) et la première (B) est passé vers l'opération suivante, dans laquelle la courroie de convoyeur (17) est reliée au moyen (11) de support par une paroi inclinée (18) en bas de laquelle l'embauchoir libéré (A) avec la tige (C) et la première (B) glisse sur la courroie de convoyeur (17), et/ou ladite courroie de convoyeur est munie de parois de confinement (21) le long des côtés et contre l'extrémité arrière de ladite courroie de convoyeur (17).

2. Machine selon la revendication 1, dans laquelle des parois de confinement (21) sont prévues le long des côtés à la fois de la courroie de convoyeur (17) et de la paroi inclinée (18) et contre l'extrémité arrière de la courroie de convoyeur (17).
3. Machine selon l'une quelconque des revendications 1, 2, dans laquelle un conteneur à roues (22) est fourni manuellement à l'extrémité avant de la courroie de convoyeur (17), ce convoyeur pouvant être déplacé à l'emplacement de l'opération suivante, les embauchoirs (A) tombant dans celui-ci après avoir été utilisés.
4. Machine selon l'une quelconque des revendications 1, 2, dans laquelle la courroie de convoyeur (17) est reliée à une autre courroie de convoyeur (23 ; 25) munie de parois de confinement (24, 26) pour faire passer les embauchoirs (A) avec la tige (C) et la première (B) automatiquement à l'emplacement de l'opération suivante.
5. Machine selon la revendication 4, dans laquelle la courroie de convoyeur (17) est reliée à ladite autre courroie de convoyeur (23) en un angle.
6. Machine selon la revendication 4, dans laquelle la courroie de convoyeur (17) est reliée en une jonction en « T » à ladite autre courroie de convoyeur (25).
7. Machine selon l'une quelconque des revendications 1, 2, dans laquelle la courroie de convoyeur (17) est entraînée par un moteur (19) commandé par des moyens (20) de commande centrale synchronisés avec les autres mouvements de la machine.
8. Machine selon la revendication 7, dans laquelle les moyens (20) de commande centrale commandent le moteur (19) de manière intermittente pour s'adapter aux mouvements de la machine.
9. Machine selon l'une quelconque des revendications 4, 5, 6, dans laquelle la courroie de convoyeur (17) est entraînée par un moteur (19), commandé par des moyens (20) de commande centrale syn- 55

chronisés avec les autres mouvements de la machine et avec le mouvement de ladite autre courroie de convoyeur (23 ; 25).

10. Machine selon l'une quelconque des revendications 1, 2, munie d'un robot qui identifie, prend et fait passer à l'emplacement de l'opération suivante les embauchoirs emportés par la courroie de convoyeur (17). 5
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11. Machine selon la revendication 10, dans laquelle la courroie de convoyeur (17) est entraînée par un moteur (19) commandé par des moyens (20) de commande centrale synchronisés avec les autres mouvements de la machine et avec les mouvements du robot. 15

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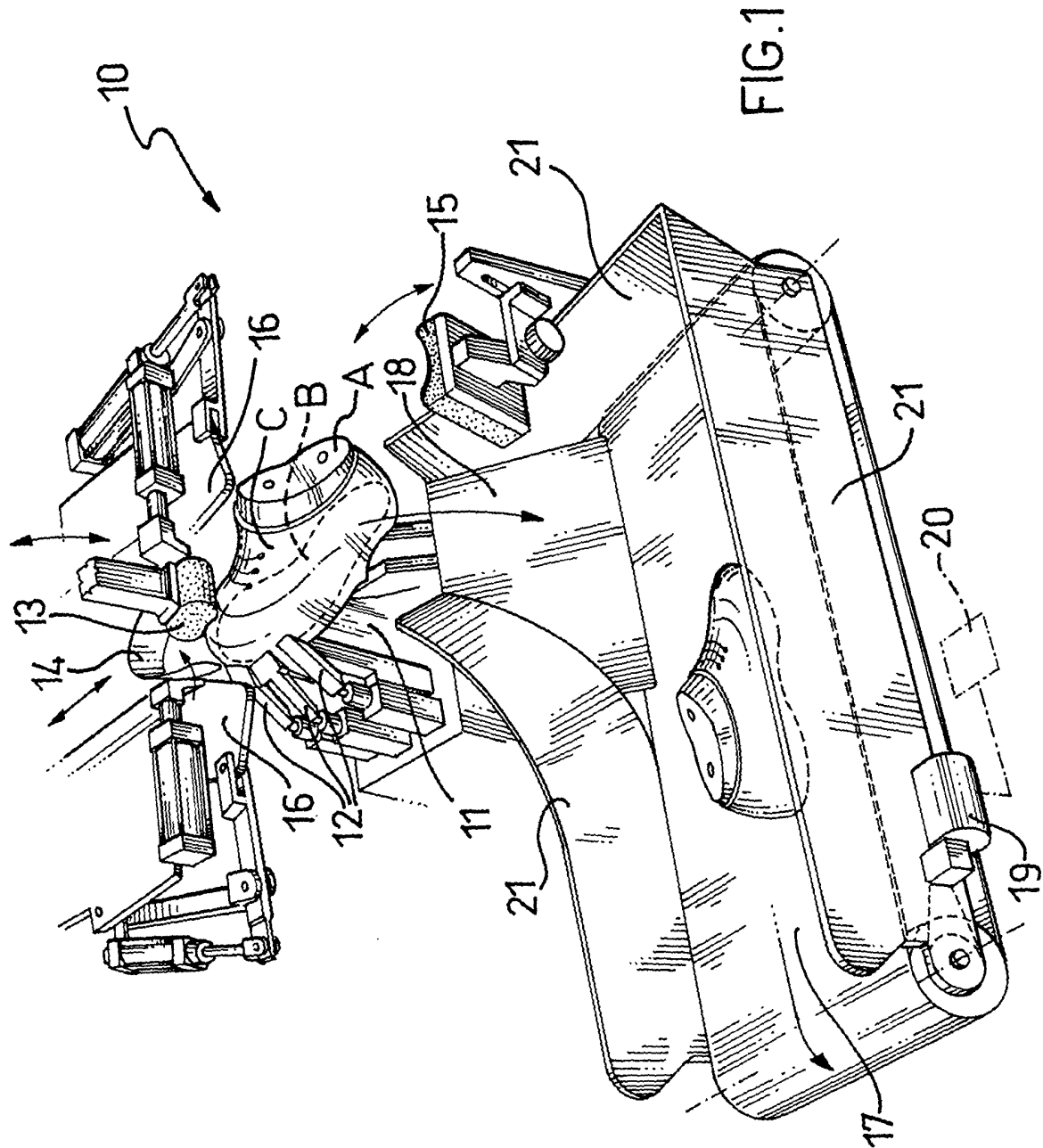
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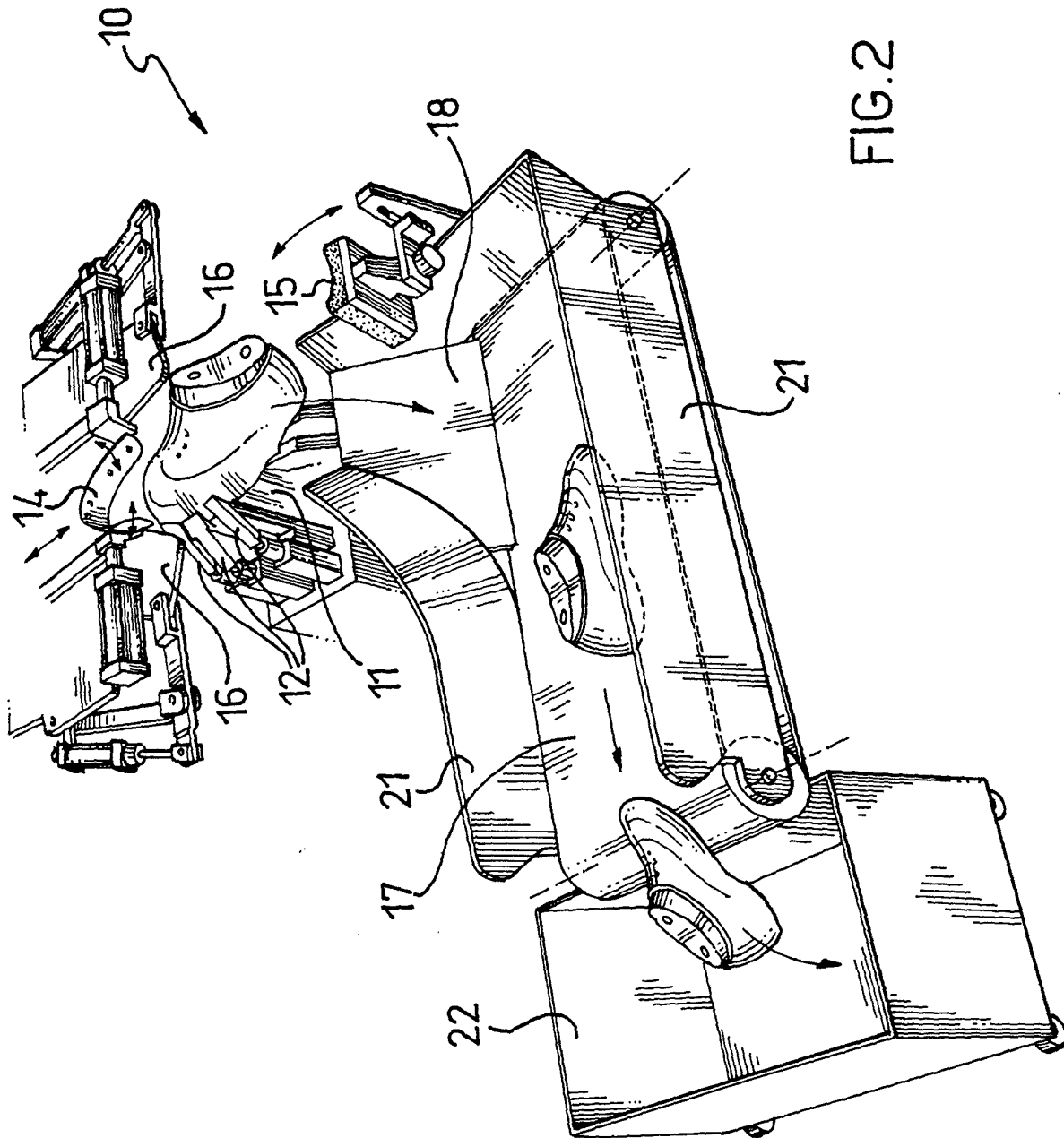


FIG. 2

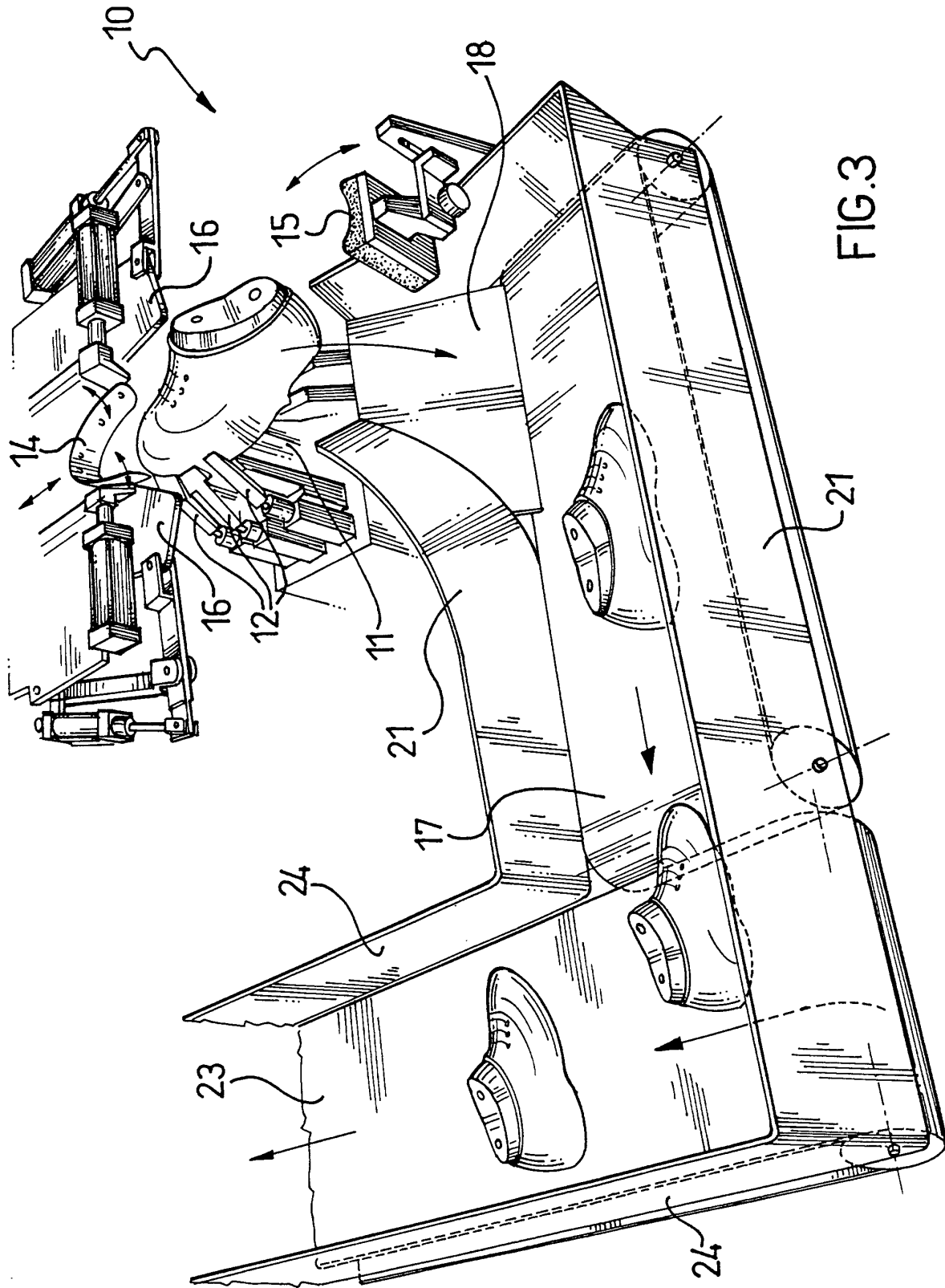


FIG. 3

