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(54) **GLUE SPREADING APPARATUS**

LEIMAUFTRAGSVORRICHTUNG

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Description

[0001] The present finding concerns a glue spreading apparatus on tapes to allow their subsequent application on the edges of panels.

[0002] More clearly, the apparatus in question can be mounted preferably on the bench of a dedicated machine with manual forward movement of the panels or else it can be arranged inside a line for the flanging of panels equipped with many work groups arranged in series with one another and also comprising, for example, in addition to the present apparatus, butting, milling, grinding, trimming and other groups.

[0003] In the wood processing industry and in particular in the furniture industry, panels tend to be coated through the application of tapes, which are then finished by rounding their edges according to the desired profiles.

[0004] The tape is applied to the peripheral edge of each panel through the interposition of a layer of glue that the apparatus picks up from a containment tank and then spreads through a roller onto the tape whilst the latter passes through the apparatus to then compress the same tape on the edge of the panel.

[0005] The glue is of the thermofusible type (EVA) having a reversible reaction with heat, or else of the polyurethane type, having an irreversible reaction with heat and therefore particularly suitable for panels intended to be arranged close to heat sources or that require a particular seal against water.

[0006] As known, the reticulation process of polyurethane glue is promoted by humidity and by temperature. The same reticulation must, on the other hand, obviously take place as soon as the glue is applied hot on the edge of the panel.

[0007] The reticulation of polyurethane glues by means of the presence of humidity is, however, an only partially solvable problem, and indeed such a type of glue is normally sold with the indication of the use by date, since it also reticulates, even if slowly, when conserved in a vacuum in its sales package.

[0008] The problem of the reticulation of polyurethane glue occurs in particular when after a work session is finished it is necessary to wait a considerable period of time before starting production again.

[0009] As known, indeed, the spreading apparatus requires planned operation stops that, for example, normally last for the break for the weekend.

[0010] Currently, based upon technology known up to now at the end of a work cycle it is necessary to dismount the tank and clean it of the remaining glue to avoid that when the next work cycle starts up the surface layer of glue that in the meantime has reticulated and therefore has hardened in contact with air does not allow the apparatus to operate correctly when restarting.

[0011] Therefore, normally after ordinary stops to start using the apparatus again it is necessary to first clean the tank. This means stopping the apparatus with inevitable costs due to the lack of production and costs in time

and personnel to clean the apparatus. Therefore, for cleaning reasons the tank must also preferably be practical and easy to disassemble in order to allow all of the areas where the glue can get stuck to be quickly reached.

[0012] In order to at least partially avoid this drawback it has for example up to now been foreseen to have many tanks for containing the glue so that while one is being cleaned the other can work.

[0013] However, this means a worsening of the costs for buying many tanks and in any case, whilst avoiding the problem of the machine having to be shut down, it does not completely solve the problems connected to the time and the personnel needing to be dedicated to the cleaning of the tanks.

[0014] More recently, at the end of the period of use of the apparatus for an ordinary stop, cleaning materials, in particular wax, are advantageously introduced instead of the glue, which by mixing with the glue avoid contact with air of the leftover film that remains on the walls.

[0015] Therefore, in the case of ordinary cleaning at the end of a work cycle it has become common practice to insulate the glue from the air and thus from humidity that is responsible to a greater extent for its reticulation by inserting a certain amount of wax inside the glue at the end of the cycle.

[0016] When activity starts again it is sufficient to wait for the complete expulsion of the wax (which is preferably dyed so as to be easily identified) before recommencing operation of the apparatus.

[0017] This solution, whilst proving more practical than the previous ones, is also not without drawbacks.

[0018] A first drawback consists of the fact that when the work cycle recommences it is necessary to completely expel the mixture of glue and wax waiting for the roller to expel all of the glue provided with wax residue that would not allow the tape to stick well onto the edge of the panel.

[0019] The removal of the glue mixed with wax takes place at the distribution roller and is rather difficult and takes quite a long time.

[0020] A further drawback consists of the fact that polyurethane glue is rather expensive and therefore, although there is generally only a minimal layer of glue in the tank when production is suspended, it is clear that especially in the case of frequent suspensions, a large amount of glue mixed with wax is thrown away.

[0021] In apparatuses that work with groups in line through which the panels automatically travel there are more sophisticated but very expensive systems to preserve the polyurethane glue preventing it from setting at the end of work.

[0022] For example, a known solution of spreading apparatus foresees the storage of polyurethane glue inside a tank in inert atmosphere, in particular in nitrogen.

[0023] The provision of a controlled inert atmosphere allows an undesired reticulation of the glue in the tank to be delayed.

[0024] The system with controlled atmosphere used

by this machine, however, is rather expensive and does not lend itself to being used in cost-effective glue spreading apparatuses intended for machines with manual advancing of the panels.

[0025] There is also a known apparatus for spreading polyurethane glue provided with a tank equipped with a hatch for inserting the glue, which is kept at the right temperature inside the tank and, through an armoured, flexible and heated tube, is carried to a distribution device having an expulsion head with a plurality of holes to spread the glue uniformly on the passing panel. Such a solution has the advantage of allowing the lifetime of the polyurethane glue to be extended by keeping it out of contact with air.

[0026] This apparatus does, however, have the drawback of also being particularly expensive. It is known from EP 1894689 a glue dispensing apparatus arranged for dispensing a desired quantity of glue onto an element to be glued comprises tank means for containing said glue and opening means arranged for enabling the washing or cleaning of, said tank means, a drawback of this apparatus resides in the fact that it is difficult to keep the glue at a uniform and constant spreading temperature

[0027] Currently, known solutions have paid little attention to the problems connected to the cleaning of the apparatus that up to now have been dealt with in a totally unsatisfactory manner.

[0028] Document DE 20203827 U discloses a glue spreading apparatus having a downward tapered vessel and a separated supplying duct that are both connected to a collection chamber (20) by a common passage way. The collection chamber (20) is placed below the vessel and supplies a dosaging roller with the glue. When the apparatus has to be stopped the glue can be unloaded from the vessel by an aperture obtained in the collection chamber (20).

[0029] In this situation, the problem forming the basis of the present invention is to avoid the drawbacks of already known solutions by providing a glue spreading apparatus that can be easily cleaned without dismounting the apparatus.

[0030] Another purpose of the present finding is to provide an apparatus that is constructively simple and operatively totally reliable.

[0031] The technical characteristics of the finding, according to the aforementioned purposes, can be clearly seen from the content of the claims shown below and its advantages shall become clearer in the following detailed description, made with reference to the attached drawings, which represent an embodiment purely as an example and not for limiting purposes, in which:

- figures 1 and 2 show two overall perspective views of a machine for gluing edges to panels, with a glue spreading apparatus according to the invention mounted;
- figure 3 schematically shows an overall perspective view of the glue spreading apparatus according to

the invention;

- figure 4 schematically shows a side view of the apparatus of figure 3;
- figure 5 shows a section view of the apparatus of figure 4 carried out along the line A-A of the same figure 4.

[0032] With reference to the attached drawings, the glue spreading apparatus object of the present finding has been wholly indicated with 1.

[0033] The apparatus 1 in question can be arranged on in-line machines for the edging of panels as gluing group arranged in series with other work groups or else preferably it can be associated with a dedicated machine (indicated with A in figures 1 and 2) for gluing edges to panels with manual advancing of the panels.

[0034] The machine A is provided with a support framework rested on the floor equipped with a work surface 3 on which the apparatus 1 according to the invention is mounted in turn provided with a support structure 2.

[0035] On the work surface 3 a containment tank 4 for containing the glue is mounted.

[0036] Such a containment tank 4 is capable of receiving both polyurethane glue, in particular in cartridge form and thermofusible glue (for example EVA) in particular in the form of grains or beads.

[0037] The containment tank has associated heating means of the glue to transform it to fluid state, *per se* known, preferably consisting of electrical resistances not illustrated in the figures.

[0038] The containment tank 4 feeds, preferably through an Archimedean screw, a head 5 for the distribution of the glue suitable for spreading it on a tape (or on a panel) through a dosaging roller 6 rotating in contact with the same tape.

[0039] Advantageously, a paddle 7 is foreseen that is thrust elastically to press the tape against the roller 6.

[0040] In accordance with a preferred characteristic of the invention, the containment tank 4 and the distribution head 5 of the glue are made from highly viscous material, in particular consisting of aluminium covered with teflon.

[0041] The dosaging roller 6 is made to rotate by a motor through transmission means preferably comprising a transmission shaft rotatably supported by bearings and suitable for transmitting motion to the dosaging roller 6 receiving it through a cardan joint from an actuation shaft connected to the motor.

[0042] The support structure 2 of the apparatus is made so as to allow simple and easy disassembly of the containment tank 4 of the glue for replacement with another different size or functional characteristic for example connected to the type of glue.

[0043] Inside the body of the glue distribution head 5 a return duct 8 is foreseen suitable for making the glue that has arrived in excess in a collection chamber (20) delimited by the dosaging roller go back into the containment tank 4 through the effect of the rotation of said dosaging roller.

[0044] The distribution head 5 comprises a circulation valve 9 placed in interference with the return duct 8, which is able to be moved between a first open position, which in normal operating conditions allows the glue to go back into the containment tank 4 transferring the excess from the collection chamber (20), and a first closed position that prevents the glue from going back into the containment tank 4 determining an overpressure upstream of the same circulation valve 9.

[0045] An expulsion valve 10 is also foreseen, placed in interference with the return duct 8 upstream of the circulation valve 9 and able to be moved between a second closed position, which with the circulation valve 9 in the first open position allows the inflow of glue from the collection chamber (20) to the containment tank 4 through the circulation valve 9, and a second open position, which with the circulation valve 9 in closed position determines the outflow of the glue through an expulsion channel 11 placed in communication with the return duct 8.

[0046] Thanks to the circulation of the glue during normal operation of the apparatus 1 it is possible to keep the same glue at a uniform and constant spreading temperature.

[0047] In accordance with a different embodiment of the present invention the circulation valve 9 and the expulsion valve 10 are replaced by a three-way valve (not illustrated) that selectively places the collection chamber (20) in communication with the containment tank 4 through the aforementioned return duct 9 and with the aforementioned expulsion channel 11.

[0048] The latter ends with an outlet mouth 12 preferably arranged on the outer side 13 of the glue distribution head 5, opposite the inner side 14 where the dosaging roller 6 is arranged to distribute the glue.

[0049] The circulation valve 9 and the expulsion valve 10 are inserted to intercept the return duct through seats formed on the upper face of the distribution head.

[0050] The glue that comes out from the outlet mouth 12 can be easily collected in a suitable container.

[0051] Therefore, operatively, at the end of a work cycle it is easy to take care of the evacuation of the glue remaining in the containment tank 4 and in the distribution head 5 by simply acting on the two valves, i.e. by displacing the return valve 9 into closed position and displacing the expulsion valve 10 into open position preferably by rotating the valves in the seats by an angle of 90 degrees.

[0052] Of course, moreover, the present finding can, in its practical embodiment, also take up different shapes and configurations to the one illustrated above without for this reason departing from the present scope of protection as defined by the claims.

Claims

1. Glue spreading apparatus, in particular on tapes **characterised in that** it comprises:

- a support structure (2);
- at least one tank (4) for containing the glue connected to said support structure (2) and carrying associated heating means to make the glue fluid;
- a collection chamber (20) and a dosaging roller (6), said collection chamber (20) being delimited by said dosaging roller (6);
- a glue distribution head (5) suitable for picking up the glue from said containment tank (4) and for spreading it on a tape or on an edge of a panel through said dosaging roller (6) rotating in contact with said tape or with said edge of a panel, said head (5) being provided with a return duct (8) suitable for taking the excess glue back into the containment tank (4) from said collection chamber (20) delimited by said dosaging roller (6);

characterised in that it comprises at least one circulation valve (9) arranged to interfere with said return duct (8), able to be moved between a first open position, which in normal operating conditions allows the glue to go back into the containment tank (4) through the effect of the rotation of said dosaging roller (6) transferring the excess from said collection chamber (20), and a first closed position that prevents the glue from going back into the containment tank (4) determining an overpressure upstream; an expulsion valve (10) arranged to interfere with said return duct (8) upstream of said circulation valve (9) able to be moved between a second closed position, which with said circulation valve (9) in said first open position allows the inflow of glue from said collection chamber (20) to said containment tank (4) through said circulation valve (9), and a second open position, which with said circulation valve (9) in closed position determines the outflow of the glue through an expulsion channel (11) in communication with said return duct (8), wherein, preferably, said circulation valve (9) and said expulsion valve (10) are replaced by a three-way valve that places said collection chamber (20) selectively in communication with said expulsion channel (11) and with said containment tank (4) through said return duct (8), thus allowing the glue to go back into the containment tank (4) through the effect of rotation of said dosaging roller (6).

2. Apparatus according to the previous claim, **characterised in that** said expulsion channel (11) ends with an outlet (12) mouth arranged on the outer side (13) of said distribution head (5) opposite the inner side (14) where said dosaging roller (6) is arranged for the distribution of the glue on said tape or panel edge.

Patentansprüche

1. Apparat zum Auftragen von Klebstoff, insbesondere auf Bänder, **dadurch gekennzeichnet, dass** er Folgendes umfasst:

- eine Halterungsstruktur (2);
- mindestens eine Wanne zur Aufnahme (4) des Klebstoffs, die mit der Halterungsstruktur (2) verbunden ist und verbundene Mittel zur Beheizung trägt, um den Klebstoff flüssig zu machen;
- eine Aufnahmewanne (20) und eine Dosierrolle (6), wobei die Aufnahmewanne (20) von der Dosierrolle (6) begrenzt wird;
- einen Kopf zur Verteilung des Klebstoffs (5), der dazu geeignet ist, den Klebstoff aus der Aufnahmewanne (4) zu entnehmen und auf einem Band oder auf einem Rand einer Platte mittels Dosierrolle (6) aufzutragen, die sich im Kontakt mit dem Band oder dem Rand einer Platte dreht, wobei der Kopf (5) mit einer Rückführleitung (8) versehen ist, die dazu geeignet ist, den überschüssigen Klebstoff von der durch die Dosierrolle (6) begrenzten Sammelkammer (20) in die Aufnahmewanne (4) zurückfließen zu lassen;

dadurch gekennzeichnet, dass er mindestens ein Zirkulationsventil (9) umfasst, das zur Interferenz der Rückführleitung (8) angeordnet ist und verschoben werden kann zwischen einer ersten Öffnungsstellung, die es dem Klebstoff unter normalen Betriebsbedingungen durch den Rotationseffekt der Dosierrolle (6) ermöglicht, unter Umfüllung des Überschusses aus der Sammelkammer (20) in die Aufnahmewanne (4) zurückzufließen, und einer ersten Schließstellung, die den Klebstoff daran hindert, in die Sammelwanne (4) zurückzufließen, indem ein vorgeschalteter Überdruck bewirkt wird; ein Auslassventil (10), das zur Interferenz der Rückführleitung (8) vor dem Zirkulationsventil (9) angeordnet ist und verschoben werden kann zwischen einer zweiten Schließstellung, die bei erster Öffnungsstellung des Zirkulationsventils (9) den Zufluss des Klebstoffs aus der Sammelkammer (20) in die Aufnahmewanne (4) durch das Zirkulationsventil (9) ermöglicht, und einer zweiten Öffnungsstellung, die bei Schließstellung des Zirkulationsventils (9) den Auslauf des Klebstoffs durch einen Auslasskanal (11) bewirkt, der in Verbindung mit der Rückführleitung (8) steht, wobei das Zirkulationsventil (9) und das Auslassventil (10) vorzugsweise durch ein Dreiwegeventil ersetzt werden, das die Sammelkammer (20) über die Rückführleitung (8) wahlweise mit dem Auslasskanal (11) und der Aufnahmewanne (4) in Verbindung setzt und es dem Klebstoff dadurch ermöglicht, durch den Rotationseffekt der Dosierrolle (6) in die Aufnahmewanne (4) zurückzufließen.

2. Apparat nach dem vorstehenden Anspruch, **dadurch gekennzeichnet, dass** der Auslasskanal (11) in einer Auslassöffnung (12) endet, die auf der Außenseite (13) des Verteilerkopfes (5) gegenüber der Innenseite (14) angeordnet ist, auf der die Dosierrolle (6) zur Verteilung des Klebstoffs auf dem Band oder dem Plattenrand angebracht ist.

Revendications

1. Appareillage pour l'enduction de colle, en particulier sur des bandes, **caractérisé en ce qu'il comprend** :

- une structure de support (2) ;
- au moins une cuve contenant la colle (4) reliée à ladite structure de support (2) et portant des moyens de chauffage associés pour rendre la colle fluide ;
- une cuve de confinement (20) et un rouleau doseur (6), ladite cuve de confinement (20) étant délimitée par ledit rouleau doseur (6) ;
- une tête de distribution de la colle (5) adaptée pour prélever la colle de ladite cuve contenant la colle (4) et l'enduire sur une bande ou sur un bord d'un panneau au moyen dudit rouleau doseur (6) tournant en contact avec ladite bande ou avec ledit bord d'un panneau, ladite tête (5) étant munie d'un conduit de recirculation (8) adapté pour faire retourner dans la cuve contenant la colle (4) la colle en excès à partir de ladite chambre de récupération (20) délimitée par ledit rouleau doseur (6) ;

caractérisé en ce qu'il comprend au moins une vanne de circulation (9) placée en interférence avec ledit conduit de recirculation (8), susceptible d'être déplacée entre une première position d'ouverture qui, dans des conditions normales de fonctionnement, permet à la colle de retourner dans la cuve contenant la colle (4) par l'effet de la rotation dudit rouleau doseur (6) en transvasant l'excès à partir de ladite chambre de récupération (20), et une première position de fermeture qui empêche la colle de revenir dans la cuve contenant la colle (4) en provoquant en amont une surpression ; une vanne d'expulsion (10) placée en interférence avec ledit conduit de recirculation (8) en amont de ladite vanne de circulation (9) déplaçable entre une deuxième position de fermeture, laquelle, avec ladite vanne de circulation (9) dans ladite première position d'ouverture permet l'amenée de colle de ladite chambre de récupération (20) à ladite cuve contenant la colle (4) à travers ladite vanne de circulation (9), et une deuxième position d'ouverture, laquelle, avec ladite vanne de circulation (9) en position de fermeture, entraîne la sortie de la colle à travers un canal d'expulsion (11) en communication avec ledit conduit de recirculation

(8), dans lequel, de préférence, ladite vanne de circulation (9) et ladite vanne d'expulsion (10) sont remplacées par une vanne à trois voies qui met ladite chambre de récupération (20) sélectivement en communication avec ledit canal d'expulsion (11) et avec ladite cuve contenant la colle (4) à travers ledit conduit de recirculation (8), en permettant ainsi à la colle de retourner dans la cuve contenant la colle (4) par l'effet de rotation du rouleau doseur (6).

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2. Appareillage selon la revendication précédente, **caractérisé en ce que** ledit canal d'expulsion (11) se termine avec une embouchure de sortie (12) placée sur le côté externe (13) de ladite tête de distribution (5) opposé au côté interne (14) ou est positionné ledit rouleau doseur (6) pour la distribution de la colle sur ladite bande ou ledit bord de panneau.

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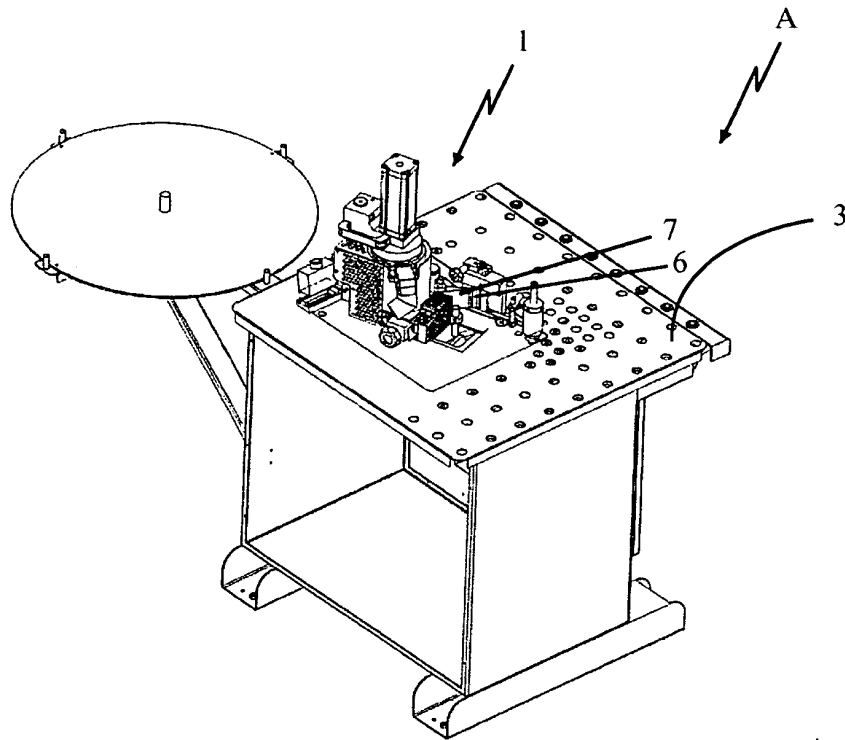


Fig. 1

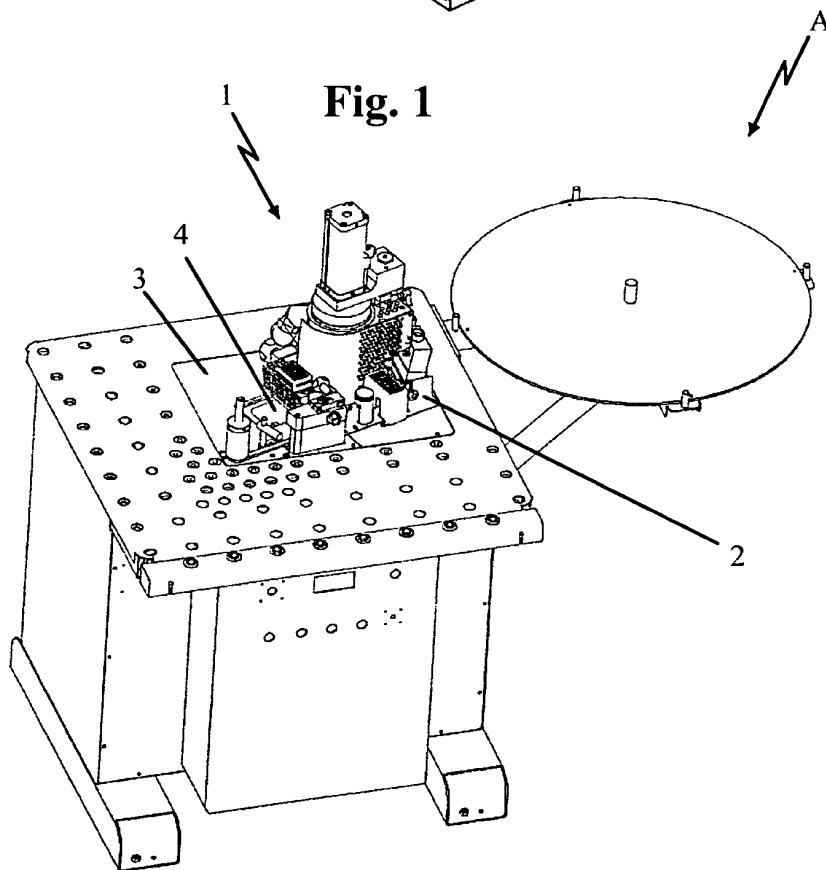


Fig. 2

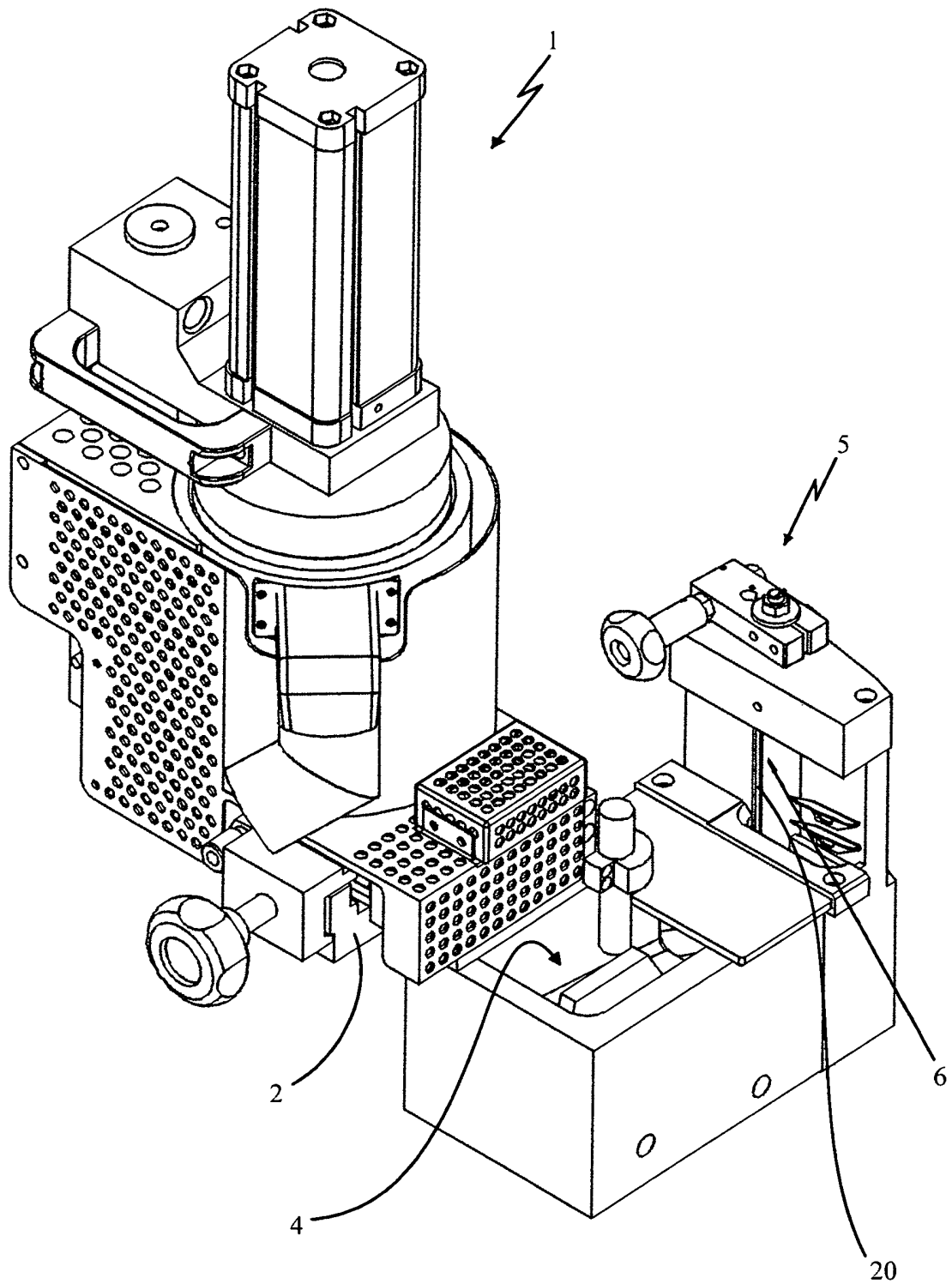


Fig. 3

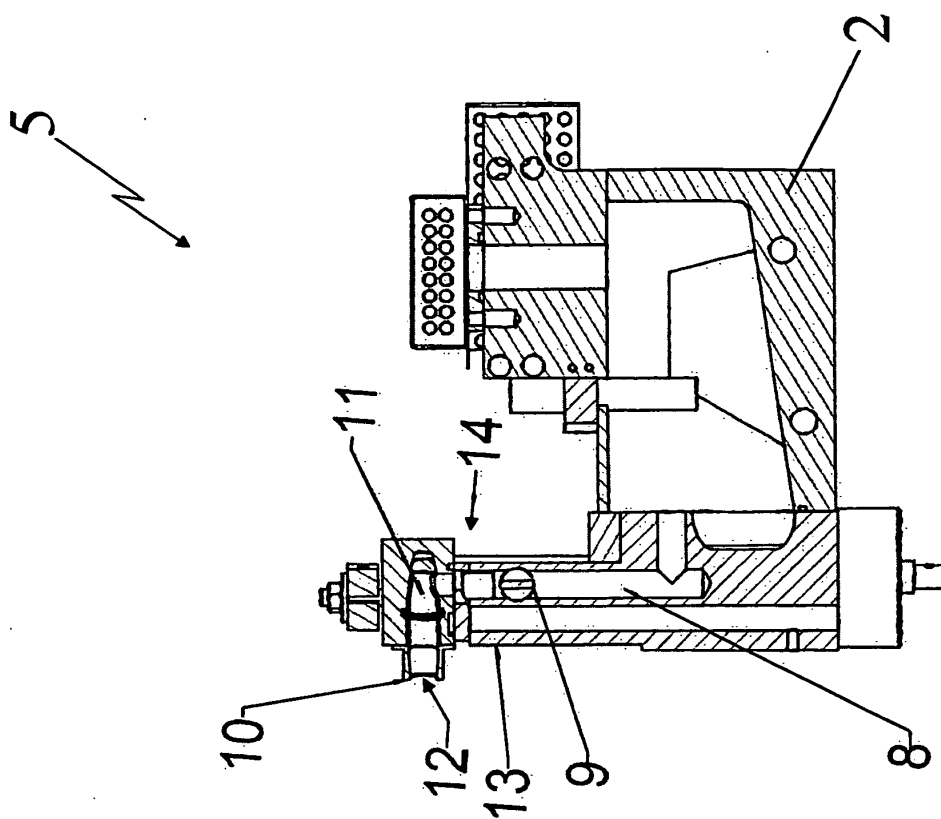


Fig. 5

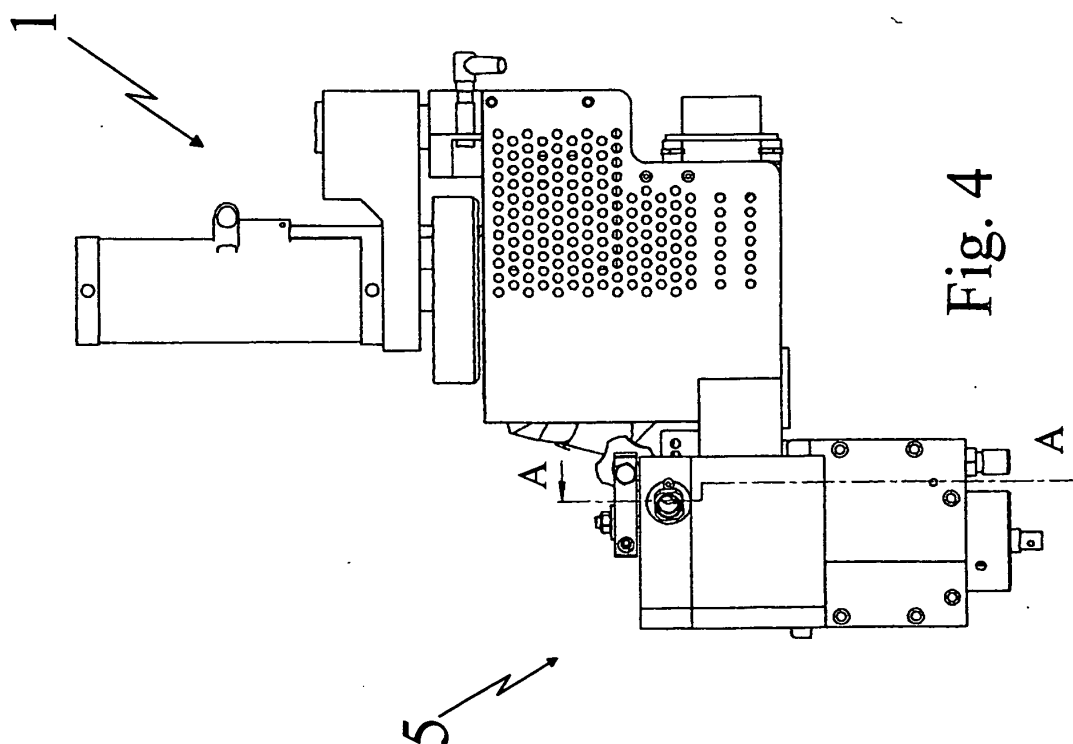


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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