Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
The present invention relates to a machine for cleaning needle holder plates for knitting machines. In these cases, cleaning results are not very satisfactory. Without the needle holder plates being fully removed but, in particular, the removal of all the needles and all the actuator rods; sometimes, these machines can operate the complete removal of the needle holder plates and, in these cases, cleaning results are not very satisfactory.

Description of the Invention

The main aim of the present invention is to provide a machine for cleaning needle holder plates for knitting machines which permits washing the needle holder plates in a practical, easy and functional way, in particularly short times and without requiring the personnel to perform long jobs.

Another object of the present invention is to provide a machine for cleaning needle holder plates for knitting machines which permits reducing greatly the costs for the maintenance and management of the needle holder plates.

Another object of the present invention is to provide a machine for cleaning needle holder plates for knitting machines which allows to overcome the mentioned drawbacks of the state of the art in the ambit of a simple, rational, easy and effective to use as well as low cost solution.

The above objects are achieved by the present machine for cleaning needle holder plates for knitting machines, having the features of claim 1.

Brief Description of the Drawings

Figure 1 is an axonometric view of the machine according to the invention; Figure 2 is an axonometric view, on enlarged scale, of a detail of the needle holder plate than can be cleaned by means of the machine according to the invention; Figure 3 is an axonometric view, from another angle, of the needle holder plate of figure 2; Figure 4 is an axonometric view, on enlarged scale, of a detail of the machine according to the invention; Figure 5 is a section view of the machine according to the invention; Figure 6 is an enlarged scale view of a detail of figure 5; Figure 7 is a block diagram which shows the hydraulic circuit of the machine according to the invention.
Embodiments of the Invention

[0020] With particular reference to such figures, globally indicated by 1 is a machine for cleaning needle holder plates for knitting machines.

[0021] The machine 1, in particular, is intended to wash one or more needle holder plates or needle beds 2, comprising:

- at least a rectangular plate-shaped body 3 having a work side 4, substantially rectilinear, and a plurality of grooves 5 substantially transversal to the work side 4; and
- a plurality of needles 6 for knitwear, housed sliding in the grooves 5 and having at least a work extremity 7 which protrudes overhanging from the work side 4.

[0022] More in detail, the plate-shaped body 3 has a first main face 8 and a second main face 9 opposite one another.

[0023] The grooves 5 are obtained on the first main face 8 and are all orthogonal to the work side 4.

[0024] The grooves 5 substantially extend along the entire width of the plate-shaped body 3, from the work side 4 as far as the opposite side 10.

[0025] Besides the needles 6, inside the grooves 5, the actuator rods 11 are also housed in a sliding way.

[0026] The attached illustrations always show just one needle holder plate 2 but it is easy to appreciate that the machine 1 is sized so as to also house several needle holder plates 2 at the same time.

[0027] The machine 1 comprises a base frame 12 for resting at the ground.

[0028] On the base frame 12 a cabinet 13 is fitted for containing the machine 1 out of which protrudes a sliding drawer mechanism 14.

[0029] The sliding drawer mechanism 14 is made up of a drawer that can slide horizontally between a washing configuration, wherein it is inserted in the cabinet 13, and a loading and unloading configuration, wherein it is extracted from the cabinet 13 and its contents are accessible from outside to load the needle holder plates 2 to be washed and remove the needle holder plates 2 already washed.

[0030] For the cleaning of the needle holder plates 2, the machine 1 has:

- a washing tank 15, where the needle holder plates 2 are cleaned;
- a supporting device 16 which can be placed in correspondence to the washing tank 15 and suitable for supporting, in a preset washing position, at least one of the needle holder plates 2;
- a locator element 17 which can be placed in correspondence to the washing tank 15 so that, when the needle holder plate 2 is placed in the preset washing position, the locator element 17 is arranged at a preset distance from the work side 4 and the work extremities 7 are arranged in contact against it to prevent the needles 6 from completely exiting from the grooves 5;
- dispensing means 18 suitable for dispensing a washing fluid 19 under pressure towards the needle holder plate 2 placed in the preset washing position.

[0031] Usefully, the washing tank 15, the supporting device 16 and the locator element 17 are associated with the base frame 12 through a sliding drawer mechanism 14.

[0032] In other words, the washing tank 15, the supporting device 16 and the locator element 17 are fitted on the drawer 14, with the supporting device 16 and the locator element 17 arranged above the washing tank 15, which defines the bottom of the drawer 14.

[0033] The dispensing means 18, on the other hand, are arranged at the top of the cabinet 13.

[0034] Alternative embodiments cannot however be ruled out wherein only the supporting device 16 and the locator element 17 are fitted on the drawer 14, while the washing tank 15 is arranged at the base of the cabinet 13; it is easy to appreciate that in this second case the supporting device 16 and the locator element 17 arrange themselves above the washing tank 15 in the washing configuration, i.e., when the drawer 14 is closed.

[0035] In the embodiment shown in the illustrations, the supporting device 16 is shaped so that, in the preset washing position, the needle holder plates 2 are substantially tilted, with the first main face 8 turned upwards and the work side 4 turned downwards.

[0036] In this regard, it must be explained that, in this treatise, to say that the work side 4 is turned downwards means it is arranged at a lower height than the opposite side 10.

[0037] More in detail, in the particular embodiment shown in the illustrations, the needle holder plates 2 are arranged with the work side 4 and the opposite side 10 substantially horizontal and with the work side 4 at a lower height than the opposite side 10.

[0038] Such arrangement is important to ensure a complete wash of the needle holder plates 2 and, above all, a correct drainage of the washing fluid 19 and of the dirt S by means of the grooves 5 and their exit through the work side 4.

[0039] Alternative embodiments are also possible wherein the work side 4, though remaining at a lower height than the opposite side 10, is not perfectly horizontal, but rather tilted with respect to a horizontal plane; it is easy to appreciate that in this case as well, the fact that the work side 4 remains turned downwards with respect to the opposite side 10 ensures the correct wash and drainage of the needle holder plates 2.

[0040] Other solutions cannot however be ruled out wherein, in the preset washing position, the needle holder plates 2 are arranged substantially horizontal. Usefully, the supporting device 16 comprises a tilted plane 20 on which the needle holder plates 2 can be rested.
To prevent the needle holder plates 2 from slipping off the tilted plane 20, the use is envisaged of a series of L-shaped brackets 21 associated with the second main face 9 of the needle holder plates 2.

For this purpose, the second main face 9 has specific coupling holes 22a for coupling with screws 22b.

The locator element 17 is associated with the supporting device 16 by means of a series of supporting arms 23 extending overhanging from the tilted plane 20. The locator element 17 is defined by a first edge that extends horizontally along the entire length of the tilted plane 20.

In the preset washing position, the work side 4 of the needle holder plates 2 is arranged substantially facing and parallel to the first edge 17.

By sectioning the machine 1 along a vertical plane orthogonal to the work side 4 (figures 5 and 6), it will be seen that the first edge 17 has a surface 17a which receives in support the work extremities of the needles 6 and which is substantially orthogonal to the tilted plane 20.

The machine 1 also comprises a protection element 24, which can be placed substantially between the dispensing means 18 and the work extremities 7 of the needles 6 in the preset washing position and which is suitable for protecting the work extremities 7 from the washing fluid 19.

In this respect, it is underlined that, depending on the type of needle holder plate 2 and the type of needles 6, the work extremities 7 can be more or less thin and fragile; to prevent the pressure of the washing fluid 19 from damaging the work extremities 7, the protection element 24 is arranged so as to divert the jet of washing fluid 19.

Advantageously, the protection element 24 is defined by a second edge which extends horizontally along the entire length of the tilted plane 20 and which is arranged substantially in the proximity of the first edge 17.

By sectioning the machine 1 with a vertical plane orthogonal to the work side 4 (figures 5 and 6), it will be seen that the second edge 24 has a transversal section tilted so as to be parallel to the tilted plane 20.

Usefully, the first edge 17 and the second edge 24 are defined by a profile having a "L"-shaped transversal section, in which one side of the "L" defines the first edge 17 while the other side of the "L" defines the second edge 24. Alternative embodiments cannot however be ruled out wherein the first edge 17 and the second edge 24 are separated, or wherein the second edge 24 is not present; in this regard, in fact, it is underlined that to clean particularly big and sturdy needles 6, which run no risk of being damaged during washing, the machine 1 can also be without the protection element 24.

The machine 1 also comprises a positioning bar 25 which can be placed in correspondence to the washing tank 15 at a preset distance from the needle holder plates 2 so that, when the needle holder plates 2 are placed in the preset washing position, the work extremities 7 of the needles 6 are arranged resting on the positioning bar 25 and kept in a substantially inclined configuration with respect to the plate-shaped body 3.

In this respect, the fact is underlined that inside the grooves 5, the needles 6 usually enjoy a certain amount of freedom of movement which enables them, therefore, to be positioned in the above tilted configuration.

It should also be noticed that during washing, the tilted configuration makes both the flow of the washing fluid 19 through the grooves 5 and, therefore, the exit of the dirt S, considerably easier.

Similarly to the locator element 17, the positioning bar 25 is fitted on the supporting arms 23 and extends horizontally along the entire length of the tilted plane 20.

Furthermore, the positioning bar 25 has a tilted border 26, defined by a rounded or joined corner, which acts as an invitation for the positioning of the needles 6 in the tilted configuration.

For this purpose, in fact, it is enough to position the needle holder plates 2 on the tilted plane 20 and manually push the actuator rods 11 and the needles 6 so they slide along the grooves 5 towards the positioning bar 25 and the locator element 17.

When the work extremities 7 reach the positioning bar 25, the tilted border 26 diverts the forward movement of the needles 6 making them tilt with respect to the plate-shaped body 3.

Once they have reached the locator element 17, furthermore, the work extremities 7 stop and the needles 6 remain in the tilted configuration.

The operation of loading the needle holder plates 2 on the machine 1 is therefore particularly easy and can be performed in just a few minutes.

By virtue of the position taken up by the needle holder plate 2 and by the needles 6, furthermore, the washing operation is generally very quick and efficient.

It is however underlined that alternative embodiments are possible wherein the needle holder plate 2 and the needles 6 are positioned differently, as in the case wherein the positioning bar 25 is not fitted and, therefore, the needles 6 do not take up a tilted position with respect to the plate-shaped body 3.

The dispensing means 18 comprise at least a nozzle 27 suitable for directing a jet of the washing fluid 19 towards the needle holder plates 2.

In the embodiment shown in the illustrations, there is just one nozzle 27 and this is fitted inside the cabinet 13 in a mobile way to serve the needle holder plates 2 along their entire length and clean all the grooves 5.

The nozzle 27, in particular, is fitted on first movement means 29, 30 suitable for moving the nozzle 27 along a direction D1 which, when the needle holder plates 2 are placed in the preset washing position, is substantially parallel to the work side 4.

The first movement means 29, 30, for example,
comprise one or more horizontal guides 29, which define the direction D1 and on which is operated sliding a first slide 30 supporting the nozzle 27.

Furthermore, the nozzle 27 is fitted on second movement means 32, 33 suitable for moving the nozzle 27 along a direction D2 which, when the needle holder plates 2 are placed in the preset washing position, is substantially parallel to the needle holder plate 2 and to the grooves 5.

The second movement means 32, 33, for example, comprise one or more tilted guides 32 which are mounted on the first slide 30, and define the direction D2 and on which is operated sliding a second slide 33 supporting the nozzle 27. The nozzle 27, finally, is fitted on third movement means 34 suitable for turning the nozzle 27 around a rotation axis A which, when the needle holder plates 2 are placed in the preset washing position, is substantially parallel to the work side 4.

The third movement means 34, for example, are defined by a rotational actuator which is mounted on the second slide 33, defines the rotation axis A and supports the nozzle 27.

Alternative embodiments cannot however be ruled out wherein several nozzles 27 are envisaged, fixed or moved differently.

In one possible alternative embodiment for example, the machine 1 is only equipped with fixed nozzles 27, distributed so as to cover the entire extension of the needle holder plates 2.

In another alternative embodiment, on the other hand, the machine 1 has a reduced set of nozzles 27 fastened to the first slide 30, which are mobile along the direction D1 but which are not mobile along the direction D2 or around the rotation axis A.

In a further alternative embodiment, on the other hand, the machine 1 has just one nozzle 27 fastened to the second slide 33, which is therefore able to move along the direction D1 and the direction D2, but not around the rotation axis A. Finally, in yet another alternative embodiment, the machine 1 has just one nozzle 27 fitted on the rotational actuator 34 which, in turn, is fastened to the first slide 30; in this case, the nozzle is therefore able to move along the direction D1 and around the rotation axis A, but not along the direction D2. Usefully, the washing fluid 19 used in the machine 1 is a liquid mixture specifically studied so as not to damage or deteriorate the material from which the needle holder plates 2 and the needles 6 are made; the washing fluid 19, in particular, consists of a mixture of demineralised water and passivating substances, but lots of other substances or substance mixtures can be used.

The washing fluid 19 sprayed by the nozzle 27 is collected in the washing tank 15 and made to circulate inside a hydraulic circuit 35 (figure 7) housed in the machine 1.

Along the hydraulic circuit 35, the washing fluid 19 collected in the washing tank 15 first of all passes through a first filtering element 36, which collects up the dirt S.

The first filtering element 36, for example, consists of a rough filter which is intended to trap the particles of dirt S of larger size.

Conveniently, the first filtering element 36 is fitted to the base of the washing tank 15 and of the drawer 14.

Downstream of the first filtering element 36, a first pumping element 37 is also housed, which operates at low pressure (2 — 4 bar) and which collects up the washing fluid coming out of the first filtering element 36 and conveys it through a second filtering element 38.

The second filtering element 38, for example, consists of a fine filter intended to collect up the particles of dirt S of smaller size.

The washing fluid 19 coming out of the second filtering element 38 then reaches a storage tank 39.

The storage tank 39 consists, for example, of a boiler intended to heat the washing fluid 19.

The washing fluid 19 used on the needle holder plates 2 does in fact have a temperature substantially between about 50 °C and 70 °C (preferably 60 °C); such temperature allows increasing the cleaning power of the washing fluid 19 and the efficacy of the wash.

Between the storage tank 39 and the dispensing means 18, a second pumping element 40 is positioned which is suitable for taking the washing fluid 19 from the storage tank 39 and pressurizing the washing fluid 19 before conveying it to the washing tank 15.

The washing fluid 19 used on the needle holder plates 2 does in fact have a pressure substantially higher than 40 bar and preferably between about 130 bar and 150 bar; such pressure allows increasing the cleaning power of the washing fluid 19 and the efficacy of the wash.

As already said, the hydraulic circuit 35 has two filtering elements 36, 38.

It must be underlined however that, in normal operating conditions, the machine 1 is able to perform cleaning of such efficacy that the dirt S is removed very quickly and without excessive disintegration; most of the removed dirt S therefore has a rather large grain size and is collected up in correspondence to the first filtering element 36.

Maintenance operations aimed at cleaning the filtering elements 36, 38 more often than not therefore only involve cleaning the first filtering element 36 which, being fitted to the base of the drawer 14, is also easily accessible and very quickly cleanable.

Claims

1. Cleaning machine (1) for cleaning needle holder plates for knitting machines, characterized by the fact that it comprises:

- at least a base frame (12);
- at least a washing tank (15), assembled on
6. Machine (1) according to one or more of the preceding claims, characterized by the fact that it comprises at least a protection element (24), which can be placed substantially between said dispensing means (18) and said work extremities (7) of said needles (6) in said preset washing position and which is suitable for protecting said work extremities (7) from said washing fluid (19).

7. Machine (1) according to the claim 6, characterized by the fact that said protection element (24) comprises at least a second edge arranged substantially in the proximity of said first edge (17a).

8. Machine (1) according to the claim 7, characterized by the fact that said first edge (17) and said second edge (24) are defined by a profile having a L-shaped transversal section.

9. Machine (1) according to one or more of the preceding claims, characterized by the fact that it comprises at least a positioning bar (25) which can be placed in said washing tank (15) at a preset distance from said needle holder plate (2) placed above said preset washing position, said work extremities (7) of the needles (6) being arranged resting on said positioning bar (25) and kept substantially inclined with respect to said plate-shaped body (3).

10. Machine (1) according to one or more of the preceding claims, characterized by the fact that said dispensing means (18) comprise at least a nozzle (27) suitable for directing a jet of said washing fluid (19) towards said needle holder plate (2).

11. Machine (1) according to the claim 10, characterized by the fact that it comprises first movement means (29, 30) of said nozzle (27) suitable for moving said nozzle (27) along a direction (D1) substantially parallel to said work side (4) in said preset washing position.

12. Machine (1) according to the claim 10 or 11, characterized by the fact that it comprises second movement means (32, 33) of said nozzle (27) suitable for moving said nozzle (27) along a direction (D2) substantially parallel to said needle holder plate (2) and to said grooves (5) in said preset washing position.

13. Machine (1) according to one or more of the claims from 10 to 12, characterized by the fact that it comprises third movement means (34) of said nozzle (27) suitable for turning said nozzle (27) around a rotation axis (A) substantially parallel to said work side (4) in said preset washing position.

Patentansprüche

1. Reinigungsmaschine (1) zum Reinigen von Nadelhalterplatten von Strickmaschinen, dadurch gekennzeichnet, dass es Folgendes umfasst:
1. Maschine (1) nach Anspruch (2);
2. Maschine (1) nach Anspruch 1, dadurch gekennzeichnet, dass die Nadelhalterplatte (2) in der voreingestellten Waschposition im Wesentlichen der ersten Kante (17a) zugewandt und parallel dazu ist.
3. Maschine (1) nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, dass es mindestens ein Positionsgeberelement (17) umfasst, das oberhalb des Waschbehälters (15) angeordnet werden kann und dazu geeignet ist, in einer voreingestellten Waschposition mindestens eine Nadelhalterplatte (2) für Strickmaschinen zu stützen, wobei die Nadelhalterplatte (2) Folgendes umfasst:
   - mindestens einen plattenförmigen Körper (3) mit einer ersten Hauptfläche (8) und einer zweiten Hauptfläche (9), die einander gegenüberliegen, und einer im Wesentlichen geradlinigen Arbeitsseite (4) (32) und mehreren Rillen (5), die auf der ersten Hauptfläche (8) erhalten werden und orthogonal zur Arbeitsseite (4) sind; und
   - mehrere Nadeln (6) für Strickwaren, die gleichzeitig in den Rillen (5) untergebracht sind und mindestens eine Arbeitsextremität (7) aufweisen, die über die Arbeitsseite (4) überhängend hervorsteht; und
   - Ausgabemittel (18), die mit dem Grundrahmen (12) verbunden sind und zum Ausgeben eines Waschfluids (19) unter Druck in Richtung der Nadelhalterplatte (2), die in der voreingestellten Waschposition angeordnet ist, geeignet sind.
5. Maschine (1) nach Anspruch 3 oder 4, dadurch gekennzeichnet, dass das Positionsgeberelement (17) mindestens eine erste Kante umfasst, wobei die Arbeitsseite (4) der Nadelhalterplatte (2) in der voreingestellten Waschposition im Wesentlichen der ersten Kante (17a) zugewandt und parallel dazu ist.
7. Maschine (1) nach Anspruch 6, dadurch gekennzeichnet, dass das Schutzelement (24) mindestens eine zweite Kante umfasst, die im Wesentlichen nahe der ersten Kante (17a) angeordnet ist.
8. Maschine (1) nach Anspruch 7, dadurch gekennzeichnet, dass die erste Kante (17) und die zweite Kante (24) von einem Profil definiert werden, das einen L-förmigen Querschnitt aufweist.
10. Maschine (1) nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, dass die Ausgabemittel (18) mindestens eine Düse (27) umfassen, die dazu geeignet ist einen Strahl des Waschfluids (19) in Richtung der Nadelhalterplatte (2) zu richten.
11. Maschine (1) nach Anspruch 10, dadurch gekennzeichnet, dass es erste Bewegungsmittel (29, 30) der Düse (27) umfasst, die dazu geeignet sind, die Düse (27) entlang einer Richtung (D1) im Wesentlichen parallel zu der Arbeitsseite (4) in der voreingestellten Waschposition zu bewegen.
12. Maschine (1) nach Anspruch 10 oder 11, dadurch gekennzeichnet, dass es zweite Bewegungsmittel (32, 33) der Düse (27) umfasst, die dazu geeignet sind, die Düse (27) entlang einer Richtung (D2) im Wesentlichen parallel zu der Nadelhalterplatte (2) und den Rillen (5) in der voreingestellten Waschposition zu bewegen.
13. Maschine (1) nach einem oder mehreren der An-
sprüche 10 bis 12, dadurch gekennzeichnet, dass es dritte Bewegungsmittel (34) der Düse (27) umfasst, die dazu geeignet sind, die Düse (27) um eine Rotationsachse (A) im Wesentlichen parallel zu der Arbeitsseite (4) in der voreingestellten Waschposition zu drehen.

Revendications

1. Machine de nettoyage (1) pour nettoyer des plaques porte-aiguilles pour des machines à tricoter, caractérisée en ce qu'elle comprend :
- au moins un corps de plaque (3) ayant une première face principale (8) et une seconde face principale (9) opposées l'une à l'autre et un bord de travail (4) sensiblement rectiligne et une pluralité de rainures (5) obtenues sur ladite première face principale (8) et orthogonales au bord de travail (4) ; et
- une pluralité d'aiguilles (6) pour le tricot, longées de manière coulissante dans lesdites rainures (5) et possédant au moins une extrémité de travail (7) qui fait saillie en surplomb dudit bord de travail (4) ; et
- des moyens de distribution (18) associés audit châssis de base (12) et aptes à distribuer un fluide de lavage (19) sous pression vers ladite plaque porte-aiguilles (2) placée dans ladite position de lavage prédéfinie.

2. Machine (1) selon la revendication 1, caractérisée en ce que, dans ladite position de lavage prédéfinie, ladite plaque porte-aiguilles (2) est sensiblement inclinée avec ledit bord de travail (4) orienté vers le bas.

3. Machine (1) selon l’une ou plusieurs des revendications précédentes, caractérisée en ce qu’elle comprend au moins un élément de positionnement (17) pouvant être placé au-dessus dudit bac de lavage (15) à une distance prédéfinie dudit bord de travail (4) de la plaque porte-aiguilles (2) placée dans ladite position de lavage prédéfinie, ladite extrémité de travail (7) étant de cette manière agencée en appui contre ledit élément de positionnement (17) pour empêcher la sortie complète desdites aiguilles (6) desdites rainures (5).

4. Machine (1) selon la revendication 3, caractérisée en ce que ledit dispositif de support (16) et ledit élément de positionnement (17) sont associés audit châssis de base (12) par l’intermédiaire d’un mécanisme de tiroir coulissant (14).

5. Machine (1) selon la revendication 3 ou 4, caractérisée en ce que ledit élément de positionnement (17) comprend au moins un premier bord, dans ladite position de lavage prédéfinie ledit bord de travail (4) de la plaque porte-aiguilles (2) étant sensiblement en regard de et parallèle audit premier bord (17a).

6. Machine (1) selon l’une ou plusieurs des revendications précédentes, caractérisée en ce qu’elle comprend au moins un élément de protection (24), pouvant être placé sensiblement entre lesdits moyens de distribution (18) et lesdites extrémités de travail (7) desdites aiguilles (6) dans ladite position de lavage prédéfinie et qui est apte à protéger lesdites extrémités de travail (7) dudit fluide de lavage (19).

7. Machine (1) selon la revendication 6, caractérisée en ce que ledit élément de protection (24) comprend au moins un second bord agencé sensiblement à proximité dudit premier bord (17a).

8. Machine (1) selon la revendication 7, caractérisée en ce que ledit premier bord (17) et ledit second bord (24) sont définis par un profilé ayant une section transversale en L.

9. Machine (1) selon l’une ou plusieurs des revendications précédentes, caractérisée en ce qu’elle comprend au moins une barre de positionnement (25) pouvant être placée dans ledit bac de lavage (15) à une distance prédéfinie de ladite plaque porte-aiguilles (2) placée au-dessus de ladite position de lavage prédéfinie, lesdites extrémités de travail (7) des aiguilles (6) étant agencées reposant sur ladite barre de positionnement (25) et maintenues sensiblement inclinées par rapport audit corps en forme de plaque (3).

10. Machine (1) selon l’une ou plusieurs des revendications précédentes, caractérisée en ce que ledits moyens de distribution (18) comprennent au moins une buse (27) apte diriger un jet dudit fluide de lavage (19) vers ladite plaque porte-aiguilles (2).

11. Machine (1) selon la revendication 10, caractérisée en ce qu’elle comprend des premiers moyens de déplacement (29, 30) de ladite buse (27) aptes à déplacer ladite buse (27) selon une direction (D1)
sensiblement parallèle audit bord de travail (4) dans ladite position de lavage prédéfinie.

12. Machine (1) selon la revendication 10 ou 11, caractérisée en ce qu'elle comprend des seconds moyens de déplacement (32, 33) de ladite buse (27) aptes à déplacer ladite buse (27) selon une direction (D2) sensiblement parallèle à ladite plaque porte-aiguilles (2) et auxdites rainures (5) dans ladite position de lavage prédéfinie.

13. Machine (1) selon l'une ou plusieurs des revendications de 10 à 12, caractérisée en ce qu'elle comprend des troisièmes moyens de déplacement (34) de ladite buse (27) aptes à faire tourner ladite buse (27) autour d'un axe de rotation (A) sensiblement parallèle audit bord de travail (4) dans ladite position de lavage prédéfinie.
REFERENCES CITED IN THE DESCRIPTION

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