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(54) SANDING APPARATUS FOR A SANDING MACHINE

SCHLEIFVORRICHTUNG FÜR EINE SCHLEIFMASCHINE

APPAREIL DE PONCAGE POUR MACHINE A PONCER

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EP-A- 1 252 972 **WO-A-96/34721**

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Description

[0001] The invention relates to a sanding device for a sanding machine, comprising a carrier, a sanding element and at least two coupling elements with which the sanding element is coupled to the carrier.

[0002] A sanding device according to the preamble of claim 1 is known from EP-A-1 252 972. WO 96/34721 discloses another type of sanding device. In this known sanding device a sanding element is connected via two pivot arms to a carrier which is releasably connected to the sanding sole of a sanding machine. The sanding element consists of a flexible support plate with pads to which a piece of sandpaper is fixed. On one side the pivot arms are mounted pivotally on the support plate and on the other arranged slidably in slotted holes in the carrier. The ends of the pivot arms can be fixed in the slotted holes via nuts. For sanding purposes the curvature of the support plate is adjusted as desired by sliding the pivot arm ends in the slotted holes and fixed in place by tightening the nuts. The sanding element thus has a fixed position during sanding.

[0003] A drawback of this known sanding device is that it is a relatively complex construction, while the degree of flexibility is very limited, particularly during sanding of surfaces with a radius of curvature.

[0004] The present invention has for its object to provide a sanding device according to claim 1, the construction of which is simpler and more suitable for sanding surfaces with different radii of curvature.

[0005] This object is achieved in that the coupling element is connected to a base and that the base is connected releasably and rotatably to the carrier. In addition to rotation of the sanding element, this measure provides the option of exchanging the sanding element, together with the base and the coupling elements, for a similar combination with a different configuration or shape. Other processing elements can moreover be placed, such as a rigid sanding element or an element adapted to carry out a process other than sanding.

[0006] In addition, the base can be releasable in at least one angular position of the carrier. Use is for instance made here of a configuration of a bayonet fitting, wherein the fitting is in the locked position in an active position of the sanding element.

[0007] Other attractive preferred embodiments are stated in the remaining claims.

[0008] The invention further relates to a sanding machine comprising a sanding sole and a sanding device, wherein the carrier of the sanding device can be formed by the sanding sole of the sanding machine or the sanding device can be releasably connected to the sanding sole of the sanding machine.

[0009] The present invention will be elucidated hereinbelow with reference to the annexed drawings, in which:

Figure 1 is a schematic perspective view of an embodiment of a sanding machine;
Figure 2 is a detail view with exploded parts of a part of the sanding machine shown in figure 1;
Figure 3 is a schematic perspective view of another embodiment of a sanding machine;
Figure 4 is a detail view with exploded parts of a part of the sanding machine shown in figure 3;
Figure 5 is a schematic perspective view of a first embodiment of a sanding device according to the invention;
Figure 6 is a schematic perspective view of a further embodiment of a sanding device according to the invention;
Figure 7 is a schematic perspective view of a final embodiment of a sanding device according to the invention, wherein a part is removed;
Figure 8 is a view corresponding with figure 7, with all parts shown;
Figure 9 is a side view of the releasable part of the sanding device shown in figures 7 and 8;
Figure 10 is a perspective top view of the releasable part of the sanding device shown in figures 7 and 8; and
Figures 11A-G show different variants of sanding elements which are connected releasably and rotatably to a carrier.

[0010] Figure 1 shows a sanding machine designated as a whole with 1, which is provided with a sanding sole 2. In the manner of a prior art sanding machine, this sanding sole 2 can be provided with a piece of sandpaper or sand cloth for performing a surface sanding operation. Sanding machine 1 is herein adapted to drive sanding sole 2 such that it executes a reciprocal movement. This can be a movement back and forth but may also be a rotating movement, or a combination of both types of movement.

[0011] A carrier 3 is fixed onto sanding sole 2. This carrier 3 is connected to sanding sole 2 for instance by means of a snap connection or as according to the method described in EP-A-1166963.

[0012] In addition to carrier 3, the sanding device for sanding machine 1 shown in figures 1 and 2 comprises a sanding element 9, 10 and two coupling elements 8 with which sanding element 9, 10 is coupled to carrier 3.

[0013] Carrier 3 is provided with two hinge constructions 4 extending in parallel as shown in figure 2. Each of these hinge constructions 4 is formed by a retaining element 5, which is formed integrally with carrier 3 and a shaft 6. Shaft 6 is provided with protruding end parts 7 which can be received by means of a snap connection in recesses 29 arranged in retaining elements 5. Hinges 6 are formed integrally with coupling elements 8.

[0014] The two coupling elements 8 are coupled to a sandpaper supporting element 9 manufactured from flexible material. This sandpaper supporting element 9 is connected for this purpose to coupling elements 8 by means of for instance glueing or another type of connec-

tion. On its outside the sandpaper supporting element 9 is provided with Velcro material. Sandpaper 10 can be arranged on the sandpaper supporting element 9 by means of a Velcro connection.

[0015] As can be seen in figure 1, it is possible to sand a curved surface, for instance a pipe 11, using the thus formed sanding device.

[0016] The majority of the workpieces to be sanded by such a sanding machine 1 have a cylindrical surface. It is therefore attractive, as in the above elucidated embodiment, for hinges 4 to extend parallel to each other. Sanding element 9, 10 will take on the form of the sanding surface as a result of the movable connection between sanding element 9, 10 and carrier 3, in that the ends of coupling elements 8 coupled to sanding element 9, 10 can move relative to each other. The flexibility of supporting element 9 and sanding machine 10 also contribute hereto.

[0017] Although this will occur less frequently in practice, it is in principle also possible to sand non-cylindrical objects with such a sanding device. It is possible to consider having the hinges 6 extend at a certain angle for this purpose.

[0018] Figures 3 and 4 show another embodiment of a sanding device, which relates principally to the manner in which the sandpaper is attached.

[0019] In the embodiment shown in figures 3 and 4 use is made of an annular piece of sandpaper 12 which is placed round a combination 13. This combination 13 is formed by a base 14 to which two coupling elements 16 are connected by means of hinges 15. The dimensions of the annular piece of sandpaper 12 and combination 13 are such that, in the situation shown in figure 4, sandpaper 12 is as flat as possible at the position of the sanding surface. In this situation the combination 13 with sandpaper 12 arranged thereon is pushed into a clip 17 arranged on carrier 3. Clip 17 fixedly clamps the combination with the sandpaper 12 arranged therearound.

[0020] As a result of the fact that combination 13 is integrally formed, coupling elements 16 will have a preferred position. They will be urged into this preferred position. A stretching force is hereby exerted on the part of sanding belt 12 adapted for the sanding operation. In the foregoing embodiment there is no such preferred position. This can of course be arranged as desired. The relevant means can be provided for this purpose.

[0021] An advantage of the embodiment shown in figure 4 is that sandpaper 12 can be used more completely. After the uppermost piece of sandpaper 12 has been used, the annular sandpaper 12 can be rotated and a subsequent piece of sandpaper 12 can be used.

[0022] The first embodiment of a sanding device according to the invention shown in figure 5 comprises a carrier 3 in the form of a sanding sole for releasable connection to a sanding machine, on which sole a base 14 is rotatably mounted. On base 14 are arranged two coupling elements 16 which are manufactured from flexible material. At least the distal ends of these coupling elements 16 are connected to a sanding element (not shown). In this embodiment the coupling elements 16 and base 14 are embodied integrally.

[0023] Base 14 is provided with a shaft which is not shown in the drawing and which extends into carrier 3 perpendicularly of carrier 3. Base 14 is provided with a nose which is not shown in the drawing and which engages under a substantially L-shaped edge 18 fixed to carrier 3. This edge 18 extends in a circular arc.

[0024] Base 14 is secured on carrier 3 in that the nose protrudes below L-shaped edge 18. Base 14 can be removed by rotating the nose from under edge 18. Base 14 can be locked on carrier 3 in diverse angular positions by per se known locking means, such as an elevation 25 as shown in figure 5 in co-action with a corresponding recess in the bottom of base 14. The action of a bayonet fitting is obtained here.

[0025] Rapid exchange of the base 14 with the sanding element arranged thereon is thus possible, wherein a good connection to base 14 is obtained despite this advantage, this being important in respect of the transfer of forces during sanding. This fastening otherwise provides the option of rapid replacement of base 14 by a base on which is placed a sanding element with a different configuration. As well as a flexible sanding element, it is thus possible for instance to apply a substantially rigid sanding element with a form adapted to the operation to be performed, such as a concave, convex, folded form or with a sharp point.

[0026] The advantages obtained with the above discussed embodiment can however also be obtained with the embodiment according to figure 6.

[0027] In the embodiment of figure 6 the reference numeral 3 designates the sanding sole of the sanding machine (not further shown) since this fulfills the function of carrier 3. A clamping element 20 is connected rotatably to sanding sole 3. Clamping element 20 is mounted for this purpose on carrier 3 by means of a shaft 21. The clamping element is provided with a U-shaped end part 22 and a pair of ridges 23. Ridges 23 continue as side walls 27 and 28, of which the wall 28 is shown broken-away in figure 6.

[0028] A base 14, on which a sanding element can be mounted via coupling elements or an element for performing another type of process can be directly mounted, is provided with two noses 24, 26. In the position of clamping element 20 shown in figure 6, the first nose 24 can be pushed into U-shaped end part 22 and the second nose 26 can be placed between ridges 23. The thus obtained assembly can then be rotated until the second nose 26 comes to lie under retaining edge 18 and is secured thereby.

[0029] Figure 7 shows a further embodiment of a sanding device according to the present invention. Use is once again made here of a carrier 3, on which is arranged a bearing 30. Bearing 30 is semicircular. An L-shaped edge 18 is further placed on carrier 3, as in the foregoing embodiment. Recesses 31 are arranged in the upper side

of the L-shaped edge.

[0030] In the present embodiment the base 14 takes the form of a flat plate 32 which is provided at one end with a disc-shaped part 33. This disc-shaped part 33 fits into bearing 30. The other end 41 of plate 32 extends under the L-shaped profile 18. A connecting piece 34 is arranged on plate 32.

[0031] The construction of the assembly described up to this point is such that from a separate position the base 14 can first be placed with its disc 33 into bearing 30 and can then be rotated in the bearing until distal end 41 of plate 32 is situated under L-shaped profile 18 and is retained there. A situation obtained in this manner is shown in figure 7.

[0032] Three recesses 31 are arranged in the upper side of L-shaped edge 18 in order to fix base 14 in one of three possible positions. Arranged on connecting part 34 is a tongue 35 which is provided on its front bottom side with a protrusion 36 which fits into each of the recesses 31. For this purpose tongue 35 has a resilient form, so that protrusion 36 can be placed into any of the recesses 31. The distal end of tongue 35 can be moved upward again using the fingers, so that protrusion 36 is lifted out of recess 31 and base 14 can be rotated.

[0033] As is apparent from figure 8, a sandpaper carrier 38 is arranged on connecting part 34. This can be placed releasably on connecting part 34 but can also be arranged fixedly. Sandpaper is attached to sandpaper carrier 38. Sandpaper carrier 38 can be a rigid element but may also be manufactured from flexible material so that the outer edges thereof can move relative to each other during sanding, and the curvature of sandpaper carrier 38, including the sandpaper, adapts to the workpiece for sanding.

[0034] It is further pointed out that sandpaper carrier 38 is placed obliquely relative to carrier 3. This means that the distance between carrier 3 and sandpaper carrier 38 is greater in the vicinity of tongue 35 than in the vicinity of bearing 30. In other words, the lower and upper edge of connecting part 34 do not extend parallel to each other (see figure 9). This measure has been taken to enable better execution of determined sanding operations. Sanding machine 1 can then be handled more easily while maintaining full contact between sandpaper carrier 38 and the workpiece.

[0035] Figure 9 further shows the separate part of the sanding device, i.e. the combination of sandpaper carrier 38 and base 32, 34 on which it is mounted.

[0036] Figure 10 finally shows the component of figure 9 from above. Here is shown that on the distal end 41 of plate 32 a chamfering 39 is arranged for easy movement of plate 32 to a position under the L-shaped edge 18. Slots 40 are further arranged in order to form resilient tongues enabling practically immobile placing of plate 32 under edge 18.

[0037] It will be apparent that base 32, 34 can be readily exchanged for a base on which a different sanding element or a different processing element is placed. Different variants are shown in figures 11A-G. Shown successively are a rigid sanding element of square (fig. 11A), V-shaped (fig. 11B), triangular (fig. 11C), finger-like (fig. 11D), concave (fig. 11E) and convex (fig. 11F) form and a flexible sanding element according to the embodiment of figures 1 and 2 (fig. 11G).

[0038] It will be apparent that numerous variations can be made to the embodiments shown here.

Claims

1. Sanding device for a sanding machine (1), comprising a carrier (3), a sanding element (9, 10; 12) and at least one coupling element (8, 16) with which the sanding element (9, 10; 12) is coupled to the carrier (3), **characterized in that** the coupling element (16) is connected to a base (14) and that the base (14) is connected releasably and rotatably to the carrier (3).

2. Sanding device as claimed in claim 1, **characterized in that** the sanding element (9, 10; 12) is coupled to the carrier (3) by at least two coupling elements (8, 16), wherein a movable connection is provided between the sanding element (9, 10; 12) and the carrier (3), and wherein the ends of the coupling elements (8; 16) coupled to the sanding element (9, 10; 12) can move relative to each other during sanding.

3. Sanding device as claimed in claim 1 or 2, **characterized in that** the base (14) can be released in at least one angular position of the carrier (3).

4. Sanding device as claimed in any of the preceding claims, **characterized in that** the base (14) can be fixed in at least one discrete angular position relative to the carrier.

5. Sanding device as claimed in any of the preceding claims, **characterized in that** a shaft (21; 33) is provided between the base (14) and the carrier (3), and that the base (14) is provided with a protruding part (26; 41) which can be engaged by an engaging element (18) forming part of the carrier.

6. Sanding device as claimed in claim 5, **characterized in that** the engaging element (18) extends in a circular arc.

7. Sanding device as claimed in claim 5 or 6, **characterized in that** the shaft is formed by a disc (33) and that a bearing (30) is arranged on the carrier (3) in order to retain the disc (33).

8. Sanding device as claimed in claim 7, **characterized in that** the disc (33) is only movable into the bearing (30) in a radial direction.

9. Sanding device as claimed in claim 7 or 8, **characterized in that** the base comprises a plate (32), of which the disc (33) forms part, wherein the plate (32) extends to a position under the engaging element (18) forming part of the carrier (3).

10. Sanding device as claimed in any of the claims 7-9, **characterized in that** on the base a tongue (35) is formed which is adapted to engage in recesses (31) arranged in the engaging element (18).

11. Sanding device as claimed in claim 10, **characterized in that** the tongue (35) is coupled to a spring for urging a protrusion (36) formed on the tongue (35) into the recesses (31).

12. Sanding device as claimed in claim 10, **characterized in that** the tongue (35) takes a resilient form for urging a protrusion (36) formed on the tongue (35) into the recesses (31).

13. Sanding device as claimed in claim 5 or 6, **characterized in that** a clamping element (20) is connected rotatably to the carrier (3), and that the base (14) can be locked with the clamping element (20).

14. Sanding device as claimed in claim 13, **characterized in that** the base (14) is provided with a first and a second nose (24, 26), wherein the first nose (24) can be placed into engagement with a U-shaped end part (22) forming part of the clamping element (20), and the second nose (26) can be enclosed between the engaging element (18) and the clamping element (20).

15. Sanding device as claimed in any of the preceding claims, **characterized in that** the sanding device comprises at least one rigid sanding element which is provided with a base adapted for coupling to the carrier (3).

16. Sanding device as claimed in claim 15, **characterized in that** the sanding element has a concave, convex, folded contour or sharp point.

17. Sanding machine comprising a sanding sole (2) and a sanding device as claimed in any of the claims 1-16, **characterized in that** the carrier (3) of the sanding device is formed by the sanding sole (2) of the sanding machine.

18. Sanding machine comprising a sanding sole and a sanding device as claimed in any of the claims 1-16 for releasable connection to the sanding sole (2).

Patentansprüche

1. Schleifvorrichtung für eine Schleifmaschine (1), die einen Träger (3), ein Schleifelement (9, 10; 12) und mindestens ein Kuppelelement (8, 16) aufweist, über das das Schleifelement (9, 10; 12) mit dem Träger (3) gekoppelt ist, **dadurch gekennzeichnet, dass** das Kuppelelement (16) mit einer Basis (14) verbunden ist und dass
die Basis (14) lösbar und drehbar mit dem Träger (3) verbunden ist.

2. Schleifvorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass**
das Schleifelement (9, 10; 12) durch mindestens zwei Kuppelelemente (8, 16) mit dem Träger (3) gekoppelt ist,
wobei zwischen dem Schleifelement (9, 10; 12) und dem Träger (3) eine bewegbare Verbindung vorgesehen ist und
wobei sich die Enden der Kuppelelemente (8; 16), die mit dem Schleifelement (9, 10; 12) gekoppelt sind, während des Schleifens relativ zueinander bewegen können.

3. Schleifvorrichtung gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Basis (14) in mindestens einer Winkelposition des Trägers (3) freigegeben werden kann.

4. Schleifvorrichtung gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Basis (14) in mindestens einer schiefen Winkelposition relativ zum Träger befestigt werden kann.

5. Schleifvorrichtung gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** zwischen der Basis (14) und dem Träger (3) ein Schaft (21; 33) vorgesehen ist und dass
an der Basis (14) ein Vorsprungsteil (26; 41) vorgesehen ist, das mit einem Eingriffsselement (18) in Eingriff gebracht werden kann, das einen Teil des Trägers bildet.

6. Schleifvorrichtung gemäß Anspruch 5, **dadurch gekennzeichnet, dass** sich das Eingriffselement (18) als Kreisbogen erstreckt.

7. Schleifvorrichtung gemäß den Ansprüchen 5 oder 6, **dadurch gekennzeichnet, dass**
der Schaft durch eine Scheibe (33) gebildet wird und dass
ein Lager (30) auf dem Träger (3) angeordnet ist, um die Scheibe (33) zu halten.

8. Schleifvorrichtung gemäß Anspruch 7, **dadurch gekennzeichnet, dass** die Scheibe (33) nur in radialer Richtung in das Lager (30) bewegbar ist.

9. Schleifvorrichtung gemäß Anspruch 7 oder 8, **dadurch gekennzeichnet, dass**
die Basis eine Platte (32) aufweist, von der die Scheibe (33) ein Teil ist,
wobei sich die Platte (32) in eine Position unter dem Eingriffselement (18) erstreckt, das einen Teil des Träger (3) bildet.

10. Schleifvorrichtung gemäß einem der Ansprüche 7 bis 9, **dadurch gekennzeichnet, dass** auf der Basis eine Zunge (35) gebildet ist, die angepasst ist, um in die Aussparungen (31) einzugreifen, die in dem Eingriffsselement (18) angeordnet sind.

11. Schleifvorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** die Zunge (35) mit einer Feder gekoppelt ist, um einen Vorsprung (36), der auf der Zunge (35) gebildet ist, in die Aussparung (31) zu drängen.

12. Schleifvorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** die Zunge (35) eine federnde Form annimmt, um den Vorsprung (36), der auf der Zunge (35) gebildet ist, in die Aussparung (31) zu drängen.

13. Schleifvorrichtung, gemäß Anspruch 5 oder 6, **dadurch gekennzeichnet, dass**
ein Klemmelement (20) drehbar mit dem Träger (3) verbunden ist und dass
die Basis (14) mit dem Klemmelement (20) arretiert werden kann.

14. Schleifvorrichtung, gemäß Anspruch 13, **dadurch gekennzeichnet, dass**
an der Basis (14) eine erste und eine zweite Nase (24, 26) vorgesehen sind,
wobei die erste Nase (24) in Eingriff mit einem U-förmigen Endstück (22) gebracht werden kann, das einen Teil des Klemmelements (20) bildet,
und die zweite Nase (26) zwischen dem Klemmelement (18) und dem Klemmelement (20) eingeschlossen werden kann.

15. Schleifvorrichtung gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schleifvorrichtung mindestens ein starres Schleifelement aufweist, an dem eine Basis vorgesehen ist, die zur Kopplung mit dem Träger (3) angepasst ist.

16. Schleifvorrichtung gemäß Anspruch 15, **dadurch gekennzeichnet, dass** das Schleifelement eine konkave, konvexe, gefaltete Kontur oder eine scharfe Spitze hat.

17. Schleifmaschine, die eine Schleifsohle (2) und eine Schleifvorrichtung gemäß einem der Ansprüche 1 bis 16 auf weist, **dadurch gekennzeichnet, dass** der Träger (3) der Schleifvorrichtung durch die Schleifsohle (2) der Schleifmaschine gebildet ist.

18. Schleifmaschine, die eine Schleifsohle und eine Schleifvorrichtung gemäß einem der Ansprüche 1 bis 16 aufweist, zur lösbaren Verbindung der Schleifsohle (2).

Revendications

1. Dispositif de ponçage pour une ponceuse (1), comprenant un support (3), un élément de ponçage (9, 10 ; 12) et au moins un élément d'accouplement (8, 16) avec lequel l'élément de ponçage (9, 10 ; 12) est couplé au support (3),
caractérisé en ce que l'élément de couplage (16) est connecté à une base (14) et **en ce que** la base (14) est connectée de manière libérable et rotative au support (3).

2. Dispositif de ponçage selon la revendication 1, **caractérisé en ce que** l'élément de ponçage (9, 10 ; 12) est couplé au support (3) par au moins deux éléments de couplage (8, 16), dans lequel une connexion mobile est prévue entre l'élément de ponçage (9, 10 ; 12) et le support (3), et dans lequel les extrémités des éléments de couplage (8 ; 16) couplés à l'élément de ponçage (9, 10 ; 12) peuvent se déplacer l'une par rapport à l'autre pendant le ponçage.

3. Dispositif de ponçage selon la revendication 1 ou 2, **caractérisé en ce que** la base (14) peut être libérée dans au moins une position angulaire du support (3).

4. Dispositif de ponçage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la base (14) peut être fixée dans au moins une position angulaire discrète par rapport au support.

5. Dispositif de ponçage selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**un arbre (21 ; 33) est prévu entre la base (14) et le support (3), et **en ce que** la base (14) est pourvue d'une partie en saillie (26 ; 41) qui peut être mise en prise par un élément de mise en prise (18) faisant partie du support.

6. Dispositif de ponçage selon la revendication 5, **caractérisé en ce que** l'élément de mise en prise (18) s'étend selon un arc circulaire.

7. Dispositif de ponçage selon la revendication 5 ou 6, **caractérisé en ce que** l'arbre est formé par un disque (33) et **en ce qu'**un palier (30) est agencé sur le support (3) afin de retenir le disque (33).

8. Dispositif de ponçage selon la revendication 7, **caractérisé en ce que** le disque (33) n'est mobile qu'à l'intérieur du palier (30) dans une direction radiale.

9. Dispositif de ponçage selon la revendication 7 ou 8, **caractérisé en ce que** la base comprend une plaque (32), dont le disque (33) fait partie, dans lequel la plaque (32) s'étend dans une position située sous l'élément de mise en prise (18) faisant partie du support (3).

10. Dispositif de ponçage selon l'une quelconque des revendications 7 à 9, **caractérisé en ce qu'**une languette (35), qui est adaptée pour se mettre en prise dans des évidements (31) agencés dans l'élément de mise en prise (18), est formée sur la base.

11. Dispositif de ponçage selon la revendication 10, **caractérisé en ce que** la languette (35) est couplée à un ressort destiné à pousser une protubérance (36) formée sur la languette (35) à l'intérieur des évidements (31).

12. Dispositif de ponçage selon la revendication 10, **caractérisé en ce que** la languette (35) adopte une forme élastique destinée à pousser une protubérance (36) formée sur la languette (35) à l'intérieur des évidements (31).

13. Dispositif de ponçage selon la revendication 5 ou 6, **caractérisé en ce qu'**un élément de serrage (20) est connecté de manière rotative au support (3), et **en ce que** la base (14) peut être verrouillée avec l'élément de serrage (20).

14. Dispositif de ponçage selon la revendication 13, **caractérisé en ce que** la base (14) est pourvue d'un premier et d'un second becs (24, 26), dans lequel le premier bec (24) peut être placé en prise avec une partie d'extrémité en forme de U (22) faisant partie de l'élément de serrage (20), et le second bec (26) peut être enfermé entre l'élément de mise en prise (18) et l'élément de serrage (20).

15. Dispositif de ponçage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif de ponçage comprend au moins un élément de ponçage rigide qui est pourvu d'une base adaptée pour se coupler au support (3).

16. Dispositif de ponçage selon la revendication 15, **caractérisé en ce que** l'élément de ponçage présente un contour concave, convexe, replié ou une pointe acérée.

17. Ponceuse comprenant une semelle de ponçage (2) et un dispositif de ponçage selon l'une quelconque des revendications 1 à 16, **caractérisée en ce que** le support (3) du dispositif de ponçage est formé par la semelle de ponçage (2) de la ponceuse.

18. Ponceuse comprenant une semelle de ponçage et un dispositif de ponçage selon l'une quelconque des revendications 1 à 16 en vue d'une connexion libérable à la semelle de ponçage (2).

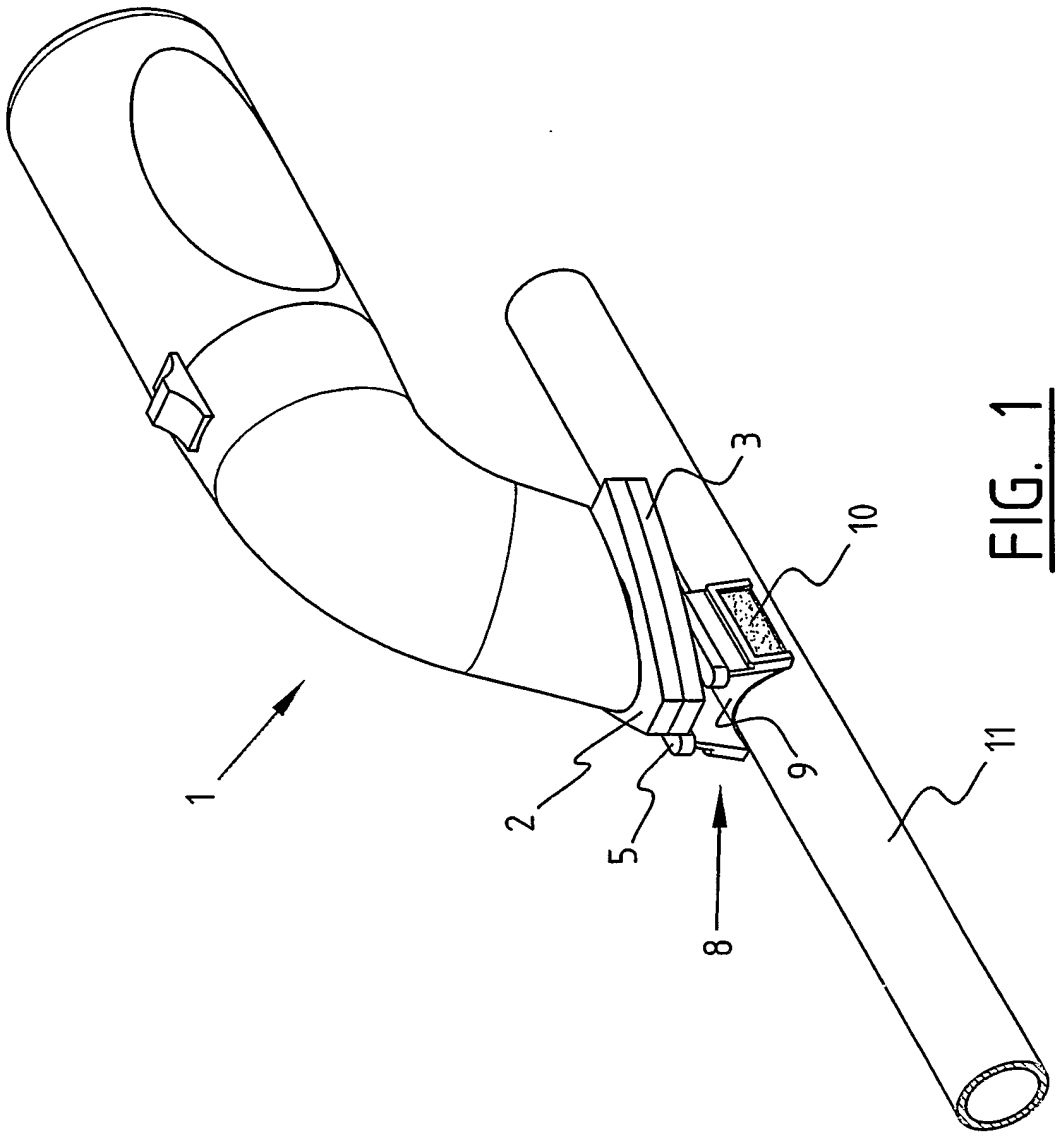

FIG. 1

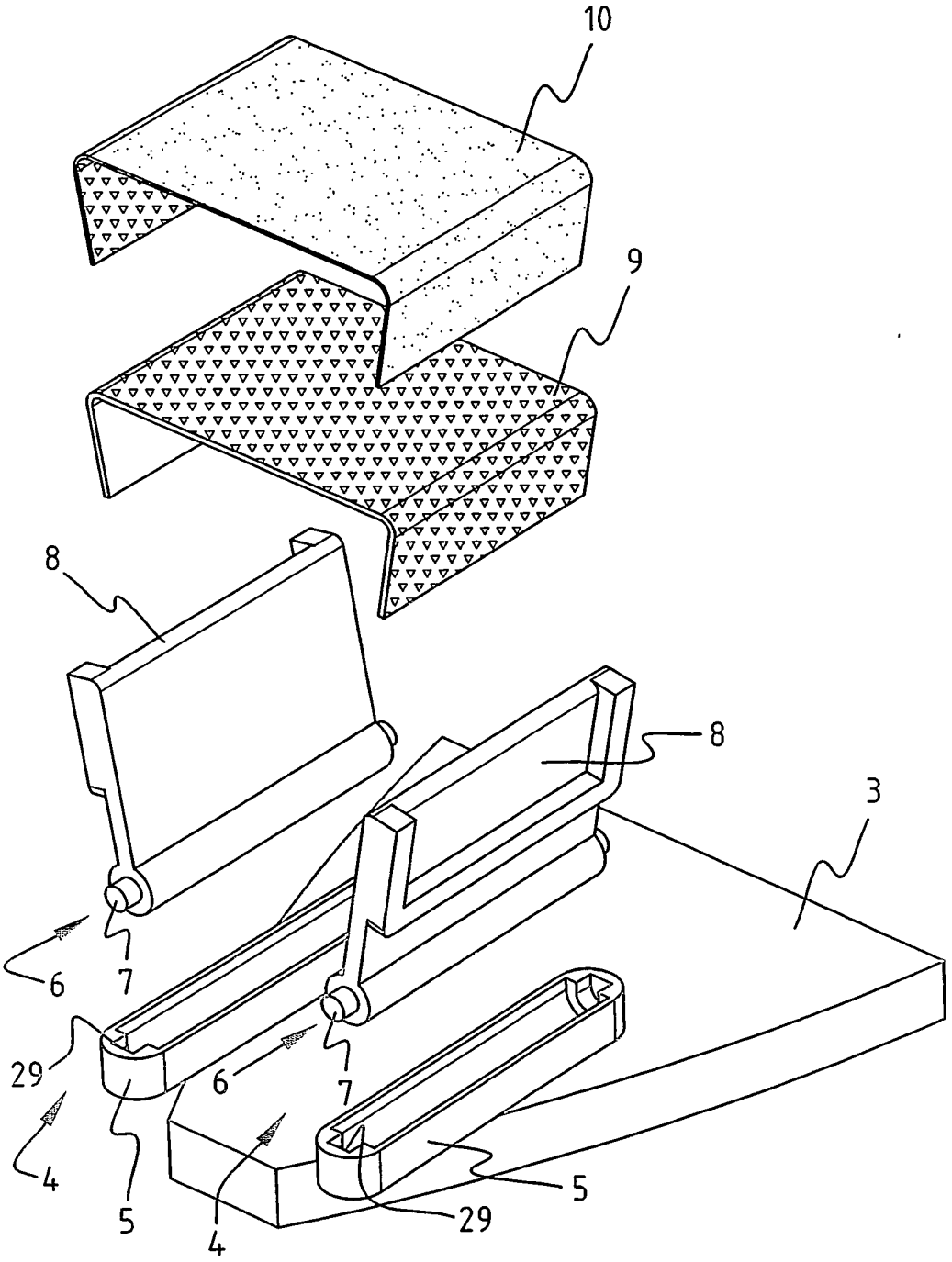

FIG. 2

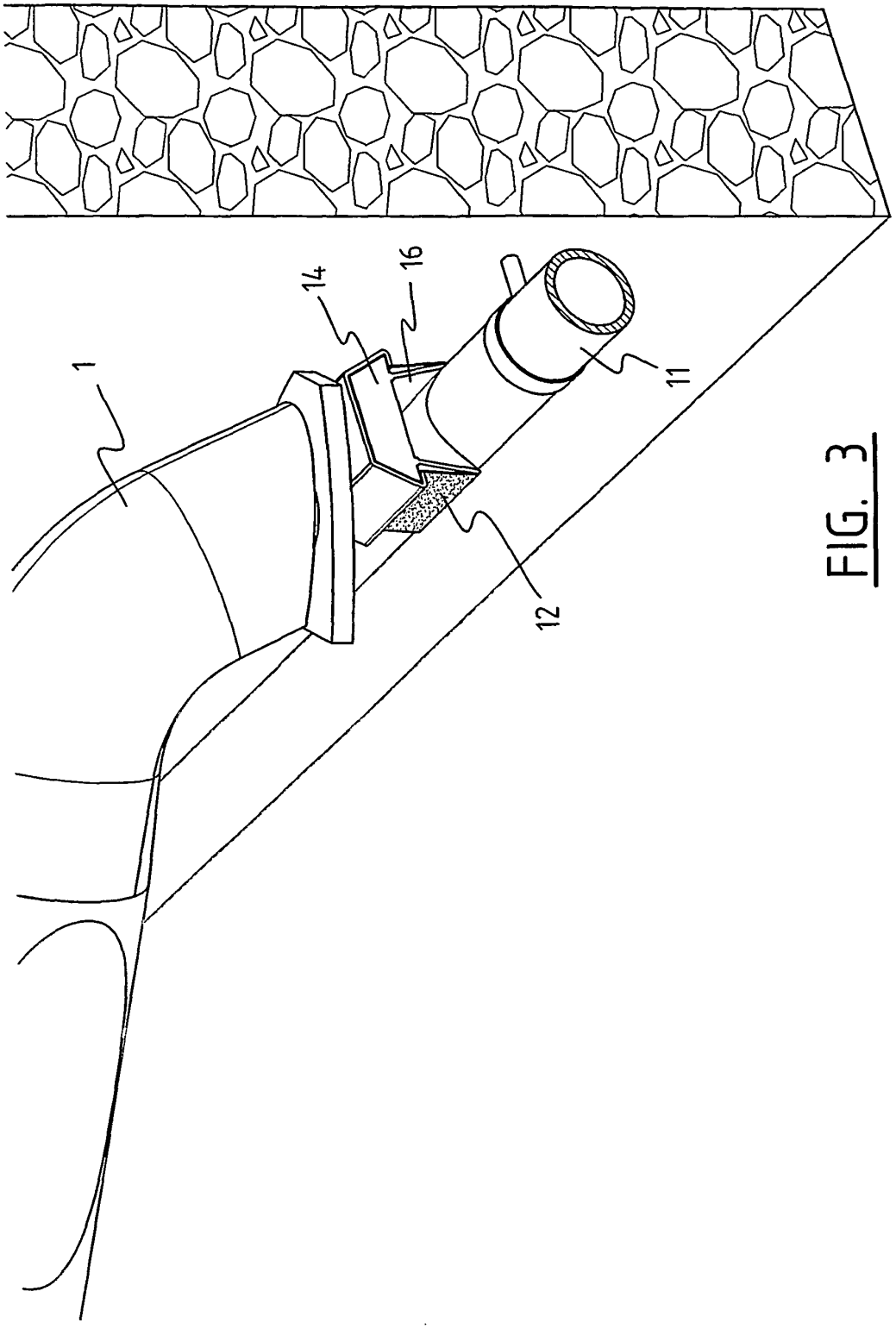

FIG. 3

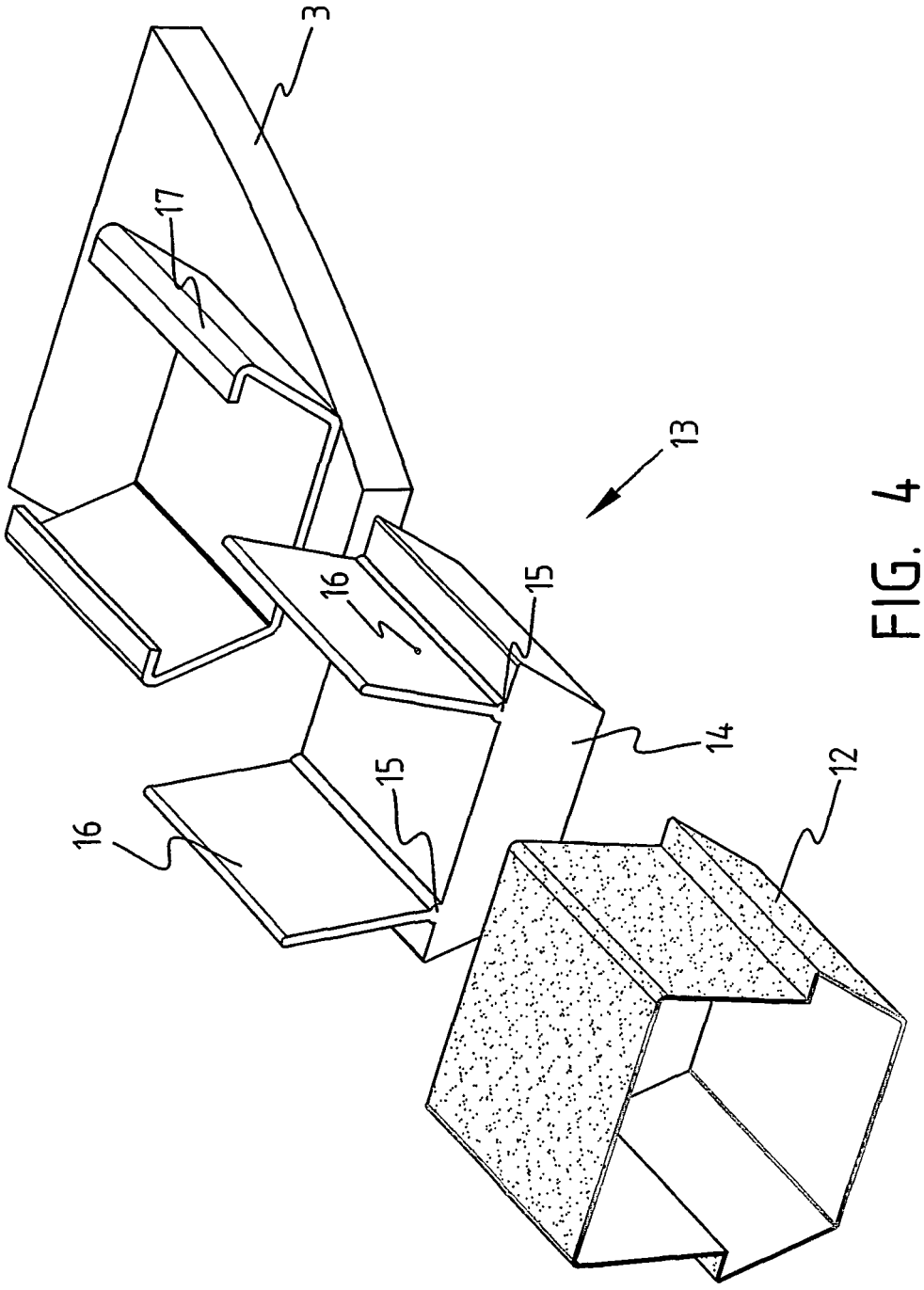

FIG. 4

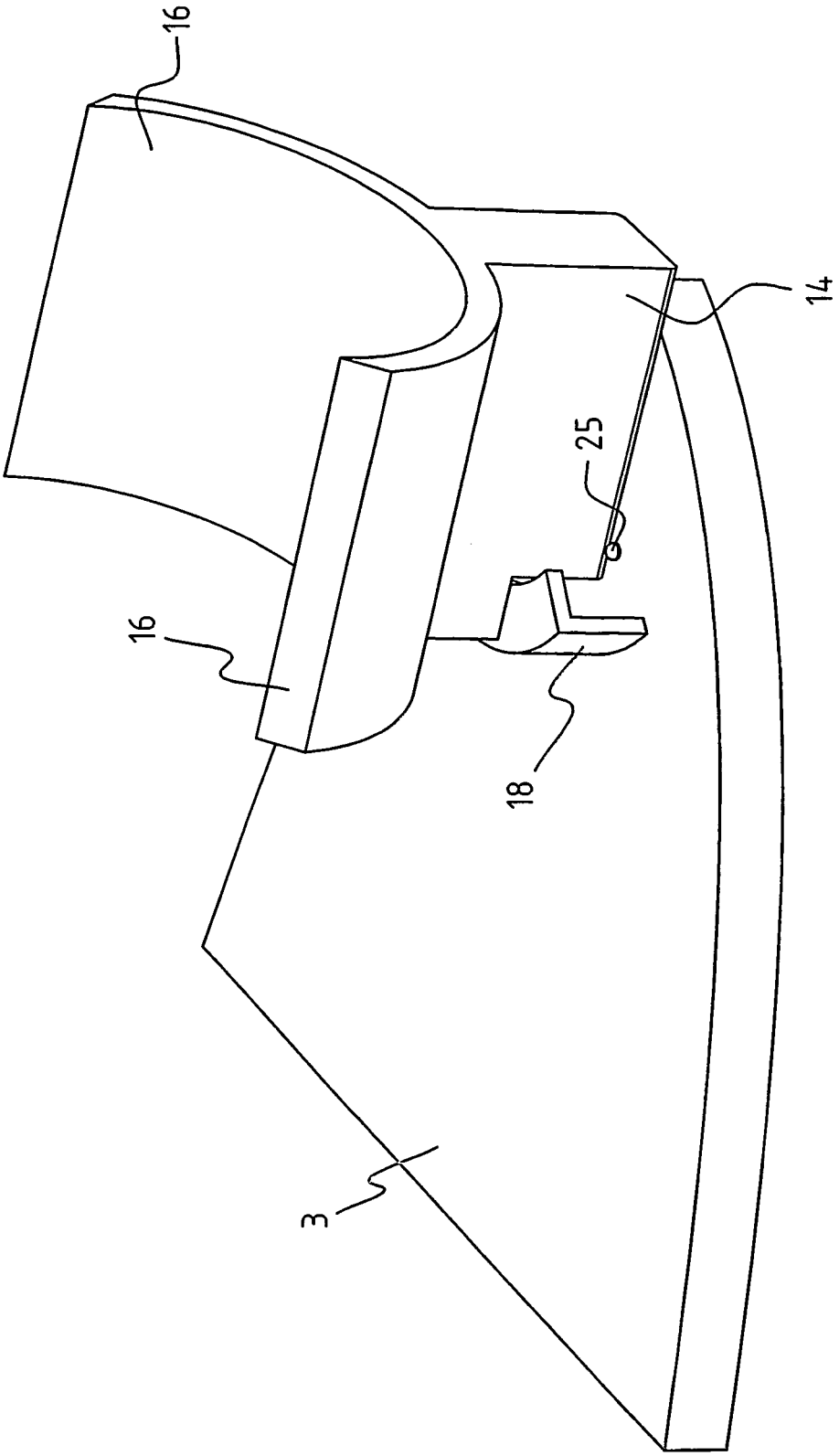

FIG. 5

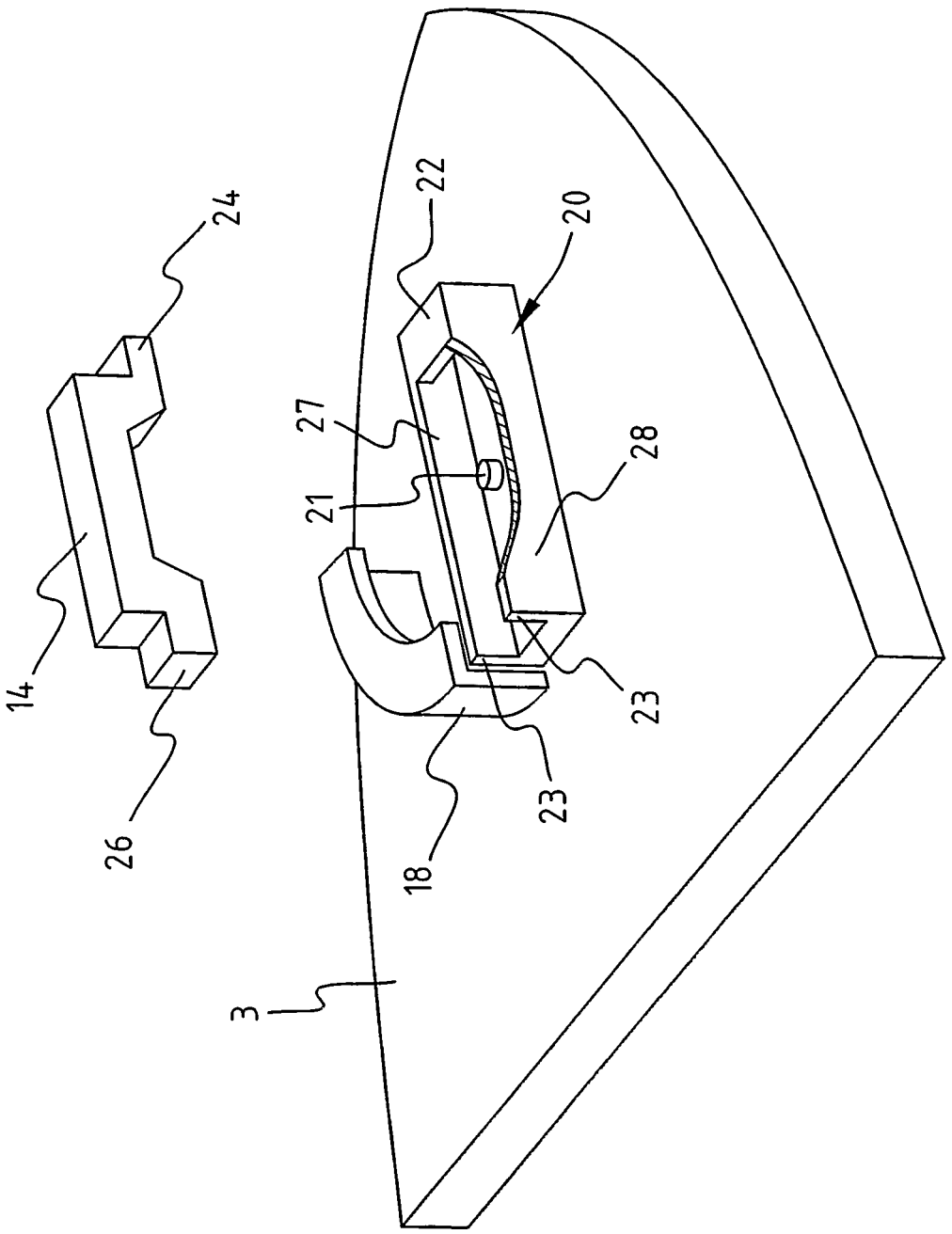

FIG. 6

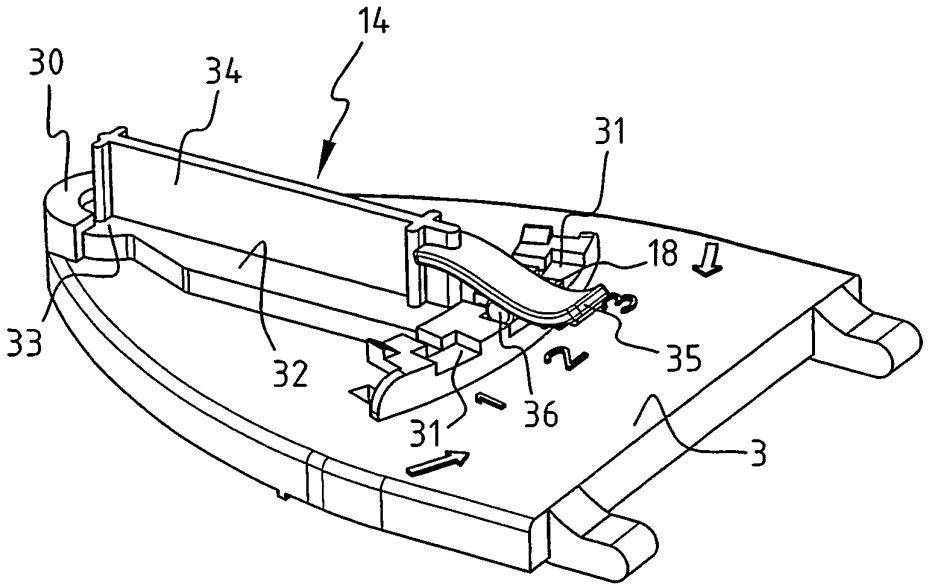

FIG. 7

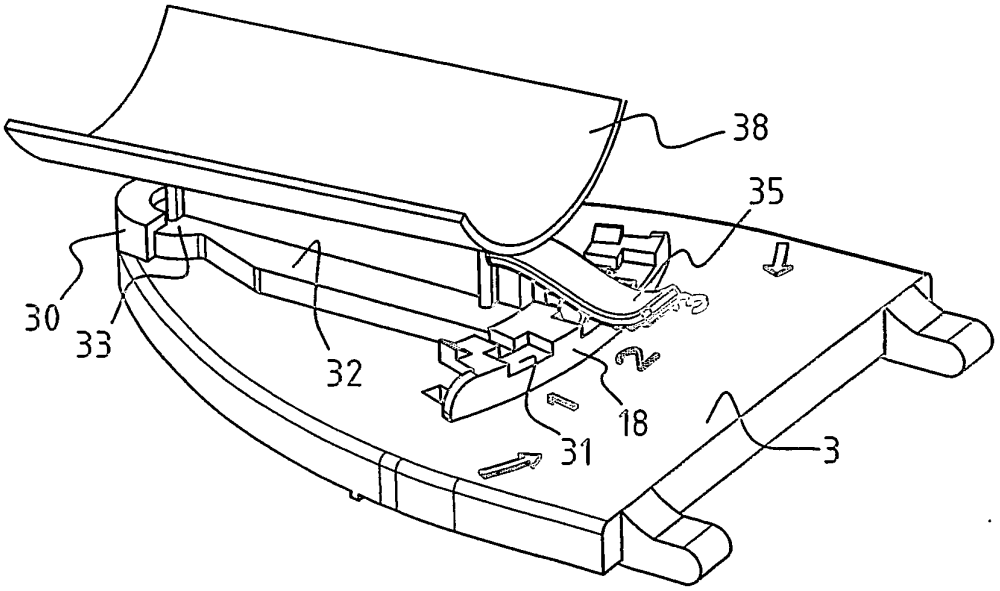

FIG. 8

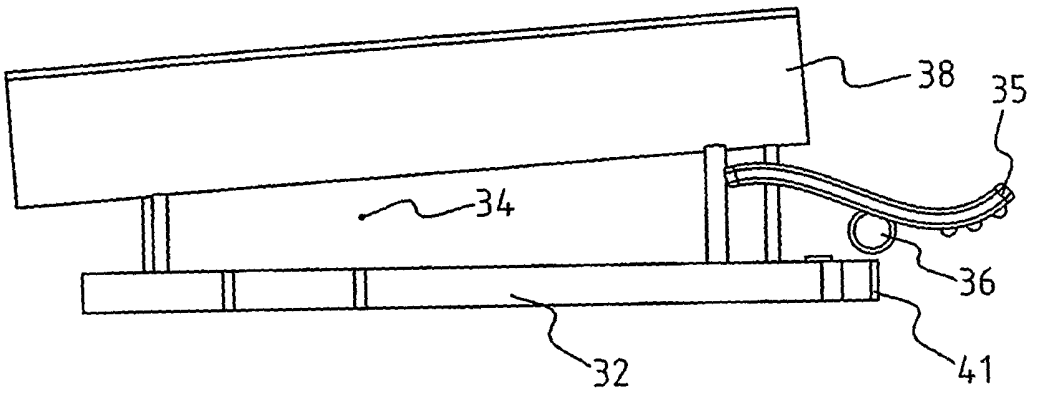

FIG. 9

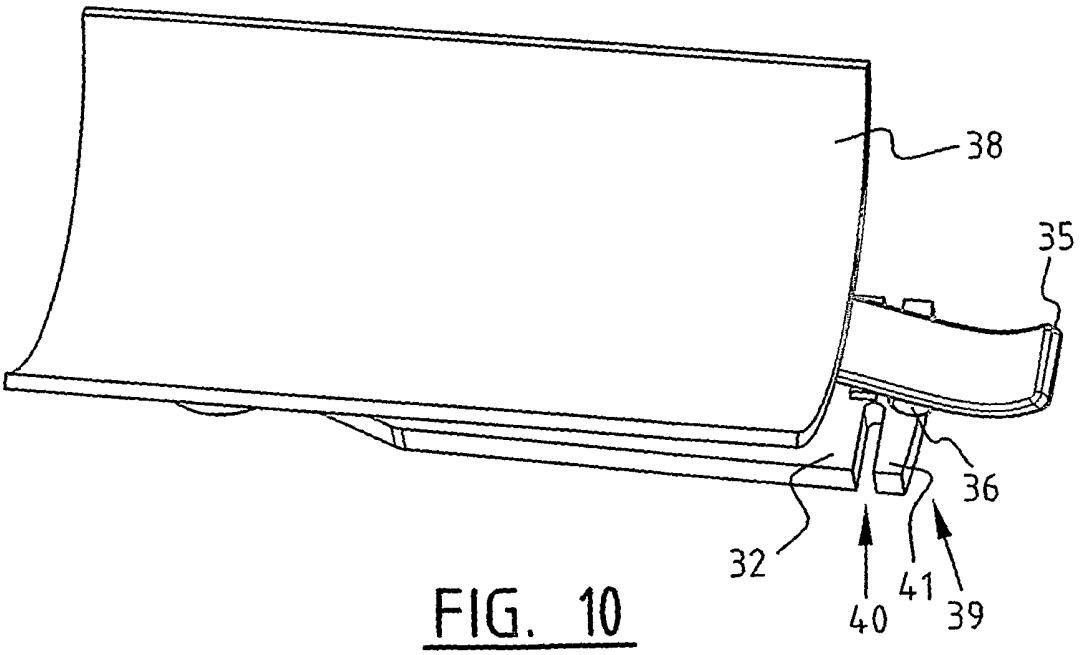

FIG. 10

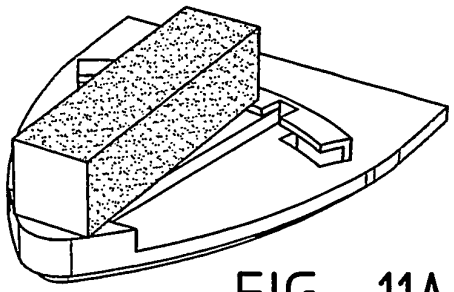

FIG. 11A

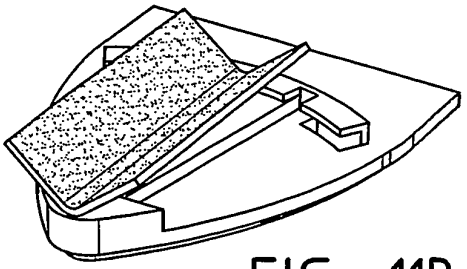

FIG. 11B

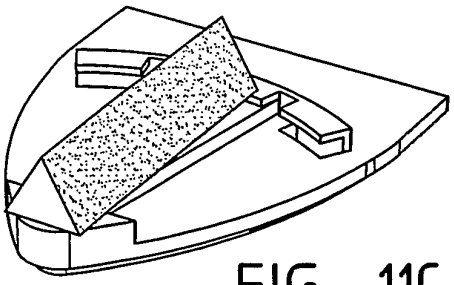

FIG. 11C

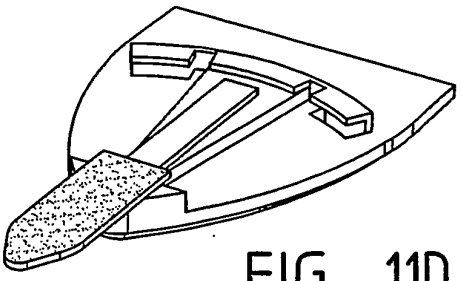

FIG. 11D

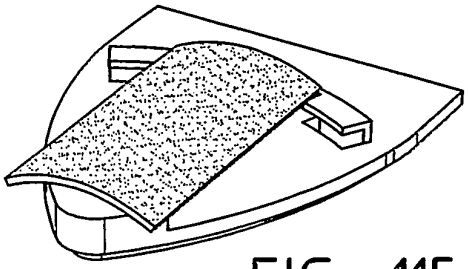

FIG. 11E

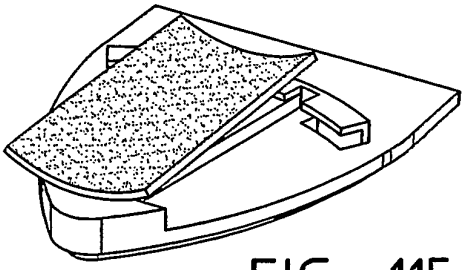

FIG. 11F

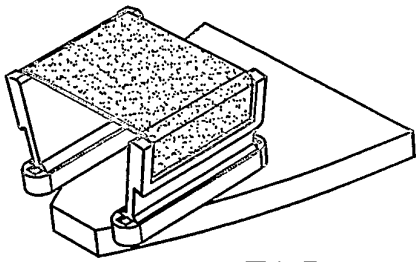

FIG. 11G

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1252972 A **[0002]**
- WO 9634721 A **[0002]**
- EP 1166963 A **[0011]**