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(54) **DEVICE FOR USE AT REMOVAL OF A WALLPAPER**

VORRICHTUNG ZUR VERWENDUNG BEIM ABLÖSEN VON TAPETEN

DISPOSITIF PERMETTANT DE RETIRER UN PAPIER PEINT

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EP 1 453 686 B1

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Description

[0001] The invention relates to a device for use at removal of wallpaper which is attached to a wall by means of an adhesive, said device comprising a holder having at least one bearing, a shaft rotatably received in the at least one bearing of the holder and having a shaft end, a motor for rotating the shaft at use, and a tool mounted on the shaft end and arranged to make holes in the wallpaper to allow water to enter in behind the wallpaper and dissolve the adhesive.

[0002] A water-soluble adhesive is generally used for paperhanging. An old wallpaper can therefore easily be removed from a wall by dissolving the adhesive using water. The dissolving can e.g. take place by letting the water penetrate through the wallpaper which is wetted with water for this purpose. However, this process is slow and difficult.

[0003] Therefore, devices have been developed that have spikes for pricking holes in the wallpaper. When the wallpaper is wetted, the water will relatively easily enter in behind the wallpaper via the thus formed holes and dissolve the adhesive.

[0004] Such a device is known from e.g. US Patent No. 4,274,202. This device is mainly composed of a shaft having two rotatable rollers provided with a number of projecting spikes along the periphery for pricking holes in the wallpaper when an operator is running the rollers across the papered wall.

[0005] A variant of this device is known from the Swedish Patent Publication No. 463 019. In this case, three rotatable, spiked rollers are mounted on a base which is mounted on an angle grinder whereby the operation of pricking holes in a wallpaper can be done more quickly and easily than with the above-mentioned, manually operated device.

[0006] DE-U-9 012 203 discloses a device according to the preamble of claim 1.

[0007] However, the spikes of the above known devices do not always penetrate through the wallpaper for certain, and this is especially the case if the wallpaper is of the type called woodchip wallpaper, as the spikes in this case often will not go completely through the projection formed by the woodchip in such wallpapers.

[0008] In one aspect of the invention a device of the kind mentioned in the opening paragraph is provided that is arranged to be able to make through holes in wallpaper better than hitherto known.

[0009] In a second aspect of the invention a device of the kind mentioned in the opening paragraph is provided that can open the projections made by the woodchip in woodchip wallpaper and remove at least a part of the woodchip in some of the opened projections.

[0010] If the tool employed is a milling cutter with cutting edges, the device can effectively cut relatively large holes in wallpaper so that water quickly can enter in behind the wallpaper via these holes and dissolve the adhesive.

[0011] If the wallpaper is woodchip wallpaper, the cutting edges can open the projections formed by the woodchip on the wallpaper and completely or partly pull the woodchip out of the opened projections. Thereby, relatively large holes are advantageously made for quickly carrying water to the adhesive behind the wallpaper.

[0012] This operation is especially effective if the cutting edges are designed as triangles having points for pulling the woodchip out of the opened projections.

[0013] In an advantageous embodiment, the milling cutter can be made as a disc of e.g. steel, whereas each cutting edge can be formed by partly punching out a portion of this disc and bending this portion out of the plane of the disc.

[0014] For being able to make holes in wallpaper quickly and effectively, the milling cutter can be provided with rows of cutting edges, for example three rows having preferably equally large mutual angle distances.

[0015] The invention will be explained in greater details below, describing only exemplary embodiments and further advantageous characteristics and technical functions with reference to the drawing, in which

Fig. 1 is an exploded side elevational view of a device according to the invention,

Fig. 2 is the device in fig. 1 in operation on a papered wall,

Fig. 3 is on a larger scale a fractional view of a cutting edge which is about to break through a projection formed by a piece of woodchip on woodchip wallpaper,

Fig. 4 is the cutting edge in fig. 3 but after the projection having been opened and the woodchip removed,

Fig. 5 is on a larger scale a plane view of the disc-shaped milling cutter in figs. 1 and 2,

Fig. 6 is a sectional view taken along the line VI - VI of fig. 5,

Fig. 7 is a sectional view taken along the line VII - VII of fig. 5,

Fig. 8 shows a second embodiment of a disc-shaped milling cutter according to the invention,

Fig. 9 shows a third embodiment of a disc-shaped milling cutter according to the invention,

Fig. 10 shows a fourth embodiment of a disc-shaped milling cutter according to the invention, and

Fig. 11 is a sectional view taken along the line XI - XI of fig. 10.

In the following, it is, as an example, assumed that the device according to the invention is to be used for making holes in woodchip wallpaper which is to be removed from a wall after the layer of adhesive behind the wallpaper has been dissolved by water added via the formed holes.

Fig. 1 is an exploded view of an embodiment of a device according to the invention.

The device comprises a disc-shaped milling cutter 1 of e.g. steel with a layer of Velcro™ 2 on one side, a knurled nut 3, an end washer 4, a middle disc 5 of a flexible material such as e.g. foam rubber with a second layer of Velcro™ 6 on the side facing the milling cutter 1, a driving plate 7 of e.g. steel with a friction lining 8 on the side facing the middle disc 5, a holder 9 consisting of a base 10 having a bearing 11 and a collar 12 defining an opening 13.

A shaft 14 journaled in the bearing 12 of the holder ends in a screwing tap 15 projecting into the holder. The shaft 14 is furthermore connected to a flexible shaft 16 which again is connected to a motor (not shown) for rotating the shaft during operation.

The holder is connected to a manoeuvre lever 19 via a universal joint 17 of known kind and a yoke 18 for manipulating the device. A vacuum hose 20 connected to a vacuum source (not shown) is communicating with the holder 9 via an opening 21 in the base 10.

In fig. 2, the device is assembled to an operational device working on a wallpaper 22 on a wall 23. The driving plate 7 is screwed onto the screwing tap 15 of the shaft 14 and the middle disc 5 is also mounted on the screwing tap 15 by means of the nut 3 and the end washer 4 abutting against the friction lining 8, which e.g. can be abrasive paper glued to the driving plate, of the driving plate.

The disc-shaped milling cutter 1 is detachably connected to the middle disc 5 by means of Velcro™ layers 2 and 6. When it is worn, the milling cutter can therefore easily be replaced by a new one. As shown, the milling cutter is provided with a number of triangular cutting edges 24 having points 25 in this case. When the device is to be used for making holes in the woodchip wallpaper 22, it is held to abut against the wall by means of the manoeuvre lever 19 with the milling cutter 1. Then, the motor (not shown) is started, after which the operator will move the device across the wallpaper 22 at a suitable rate, the universal joint 17 ensuring the continuous abutment of the milling cutter against the wallpaper along its entire exterior.

Figs. 3 and 4 are fractional views on a larger scale of how the cutting edges 24 during this are making holes 26 in the woodchip wallpaper 22 which is glued to the wall 23 by means of a layer of adhesive 27. A piece of the woodchip 28 is forming a projection 29 on the wallpaper.

In fig. 3, the milling cutter 1 is turned in the direction of the arrow towards the projection 29 containing the

woodchip 28. Thereby, the projection is opened and the woodchip removed by, among other things, the point 25 of the cutting edge 24.

In fig. 4 it is seen how a large hole 26 thereby is made that will allow water to enter behind the wallpaper 22 quickly and effectively and dissolve the adhesive 27. To obtain a good result without unnecessary application of power to penetrate the plane part of the wallpaper, the height of the triangular cutting edges above the plane of the milling cutter corresponds to or is slightly lower than the average height of the projections of the woodchip wallpaper.

Figs. 5, 6 and 7 show a first embodiment of a milling cutter 30 according to the invention. In this case, the milling cutter consists of a steel disc 31, on which three rows of four triangular cutting edges 32 in each are made, each edge having a point 33. The three rows are located at a mutual angular distance of 120°.

Each of the triangular cutting edges are punched free of the steel disc on two sides and bent out of the plane of the disc along the third side 34 which is extending in continuation of each other in each row. Simultaneous with the punching of the triangular cutting edges 32 in each row, a slot 35 is also punched that is defined by the third side 34 of the cutting edges and an opposite side 36.

As seen, the punched-out areas only constitute a small part of the total area of the disc. When the device is in operation, the remaining, large, plane face of the disc is supporting against the projections of the woodchip wallpaper and thereby keeping the cutting edges at correct cutting height above the wallpaper. Thereby, the device will operate with optimum effect and the risk of the cutting edges cutting into the wallpaper in such a way that the device could get out of control is moreover eliminated.

Paper and woodchip torn off the wallpaper during use of the device have a tendency of getting packed in front of the cutting edges - seen in the rotating direction indicated by the arrow. The efficiency of the cutting edges could thereby be reduced considerably.

To avoid this damaging effect, the three rows of cutting edges are each located on the disc with an oblique inclination facing backwards in relation to the rotating direction. The centrifugal force originating when the disc is rotating with a rotational speed of e.g. between 500 and 2000 rpm will therefore easily be able to fling the packed material free of the cutting edges along the slots 35.

For environmental considerations, the holder is connected to a vacuum source (not shown) via the vacuum hose 20 and the opening 21 (figs. 1 and 2) for sucking out the material that is detached when the device is operating.

Fig. 8 shows a second embodiment of a milling cutter 37 according to the invention. This milling cutter cor-

responds in the main to the milling cutter 30 in figs. 5, 6 and 7, and like parts are therefore designated by the same reference numerals. The difference is that the slots 35 now are located behind the cutting edges - seen in the rotating direction indicated by the arrow, whereby torn-off wallpaper and woodchip will have difficulty in getting stuck on the cutting edges.

Fig. 9 shows a third embodiment of a milling cutter 38 according to the invention. Also this milling cutter corresponds in the main to the milling cutter 30 in figs. 5, 6 and 7, and like parts are therefore also in this case designated by the same reference numerals. In fig. 9, there are however three double-rows of triangular cutting edges 33. In one row 39 of such a double-row, there are four triangular cutting edges 32 with points 33 and in the second row 40 behind the row 39, there are three triangular cutting edges 32 with points 33 located between the points 33 of the cutting edges 32 of the first row 39. The points of the cutting edges of this rear row 40 will therefore advantageously tear up the part of the wallpaper which is left between the points of the cutting edges of the first row 39 during the rotation of the milling cutter.

Figs. 10 and 11 show a fourth embodiment of a milling cutter 41 according to the invention having five double-rows of cutting edges 42, each formed in this case by pressing a punching die through the plate so that the surrounding material partly will crack and rise to form cutting edges.

Claims

1. A device for use at removal of wallpaper (22) which is attached to a wall (23) by means of an adhesive (27), said device comprising a holder (9) having at least one bearing (11), wherein the holder is designed as a cup having a base (10) with the at least one bearing (11) and a collar (12) defining an opening (13), a shaft (14) rotatably received in the at least one bearing of the holder and having a shaft end (15), a motor for rotating the shaft at use, and a tool mounted on the shaft end in form of a disc-shaped milling cutter (30;37;38;41) for making holes in the wallpaper to allow water to enter in behind the wallpaper and dissolve the adhesive, the milling cutter having at least one cutting edge (24;42) extending at least partly beyond the boundary of the collar (12), **characterised in that** said milling cutter is formed as a triangle punched out of the disc along two sides and bent out of its plane along its third side (34).
2. A device according to claim 1, **characterised in that** the third side of the triangular cutting edge (24) is extending radially outwards from the centre of the disc (30;37;38) or obliquely backwards in relation to

the rotating direction.

3. A device according to claim 1 or 2, **characterised in that** at least one row of a number of triangular cutting edges (24) is formed in the disc (30;37;38), the third sides of said cutting edges extending in continuation of each other.
4. A device according to claim 1, 2 or 3, **characterised in that** three rows of triangular cuttings edges (24) are formed in the disc (30;37;38) at mainly the same mutual angular distance.
5. A device according to claim 4, **characterised in that** a slot (35) is punched in the disc (30;37;38) at each row of triangular cutting edges (24), said slot having a first side extending along the third side (34) of the triangular cutting edges and a second side (36) located oppositely and at a distance of the first side.
6. A device according to any of the claims 1 - 5, **characterised in that** the height of the cutting edges (24; 42) of the milling cutter (30;37;38;41) above its plane corresponds to or is slightly lower than the average height of the projections (29) on a woodchip wallpaper (22).
7. A device according to any of the claims 1 - 6, **characterised in that** the milling cutter (30;37;38;41) is detachably mounted on the shaft end (15) via a fixed driving plate (7) fastened on the shaft end and a middle disc (5) made of a flexible material and abutting on the driving plate via a friction lining (8), and that the milling cutter is detachably mounted on the middle disc via a Velcro™ joining (2,6).
8. A device according to any of the claims 1 - 7, **characterised in that** the disc (30;37;38;41) is of metal.

Patentansprüche

1. Eine Einrichtung zur Verwendung bei dem Ablösen einer Tapete (22), die mittels eines Kleisters (27) an einer Wand (23) angebracht ist, mit einem mit wenigstens einem Lager (11) versehenen Halter, der schalenförmig mit einem Boden (10) mit dem wenigstens einen Lager (11) und einem eine Öffnung (13) begrenzenden Rand (12) ausgebildet ist, einer Welle (14), die drehbar in dem wenigstens einen Lager des Halters aufgenommen ist und mit einem Wellenabschnitt (15), einem Motor zum Drehen des Schafts bei Verwendung und einem Werkzeug, das nach Art eines Fräasers (30; 37; 38; 41) auf dem Wellenabschnitt montiert zum Erstellen von Löchern in der Tapete zum Eintretenlassen von Wasser hinter die Tapete und zum Lösen des Kleisters, wobei der Fräser wenigstens eine Schneidkante (24; 42) hat, die

sich jedenfalls teilweise über die Begrenzung des Randes (12) hinaus erstreckt, **dadurch gekennzeichnet, dass** der Fräser als aus der Scheibe entlang zweier Seiten ausgestanztes und aus seiner Ebene entlang seiner dritten Seite (34) abgewinkeltes Dreieck ausgebildet ist.

2. Eine Einrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die dritte Seite der dreieckigen Schneidkante (24) sich von dem Mittelpunkt der Scheibe (30; 37; 38) radial nach außen oder in Bezug auf die Drehrichtung schräg nach hinten erstreckt. 10
3. Eine Einrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** wenigstens eine Reihe einer Anzahl von dreieckigen Schneidkanten (24) in der Scheibe (30; 37; 38) ausgebildet ist, wobei sich die dritten Seiten der Schneidkanten kontinuierlich zueinander erstrecken. 15
4. Eine Einrichtung nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** drei Reihen von dreieckigen Schneidkanten (24) in der Scheibe (30; 37; 38) mit im wesentlichen gleichem gegenseitigem Winkelabstand ausgebildet sind. 20
5. Eine Einrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** ein Schlitz (35) in der Scheibe (30; 37; 38) an jeder Reihe der dreieckigen Schneidkante (24) ausgestanzt ist, wobei der Schlitz eine erste Seite, die sich entlang der dritten Seite (34) der dreieckigen Schneidkanten erstreckt, und eine zweite Seite (36), die gegenüberliegend und mit Abstand zu der ersten Seite angeordnet ist, hat. 25
6. Eine Einrichtung nach einem der Ansprüche 1 - 5, **dadurch gekennzeichnet, dass** die Höhe der Schneidkanten (24; 42) des Fräasers (30; 37; 38; 41) oberhalb seiner Ebene der durchschnittlichen Höhe der Vorsprünge (29) einer Rauhfasetapete (22) entspricht oder geringfügig geringer als diese sind. 30
7. Eine Einrichtung nach einem der Ansprüche 1 - 6, **dadurch gekennzeichnet, dass** der Fräser (30; 37; 38; 41) lösbar an dem Schaftabschnitt (15) über eine feste Antriebsplatte (7), die an dem Schaftabschnitt befestigt ist, montiert ist, und eine mittlere Scheibe (5), die aus einem flexiblen Material besteht und an die Antriebsplatte über eine Friktionsauskleidung (8) anstößt, und **dadurch, dass** der Fräser an der mittleren Scheibe mittels eines Klettverschlusses (2, 6) lösbar montiert ist. 35
8. Eine Einrichtung nach einem der Ansprüche 1 - 7, **dadurch gekennzeichnet, dass** die Scheibe (30; 37; 38; 41) aus Metall besteht. 40

Revendications

1. Dispositif permettant de retirer un papier peint (22) qui est attaché à un mur (23) au moyen d'un adhésif (27), ledit dispositif comprenant un support (9) ayant au moins un palier (11), dans lequel le support est conçu comme une coupelle ayant une base (10) avec le au moins un palier (11) et un col (12) définissant une ouverture (13), un arbre (14) reçu de façon tournante dans le au moins un palier du support et ayant une extrémité d'arbre (15), un moteur pour entraîner en rotation l'arbre en utilisation, et un outil monté sur l'extrémité d'arbre sous la forme d'une fraise en forme de disque (30 ; 37 ; 38 ; 41) permettant de faire des trous dans le papier peint pour permettre à de l'eau d'entrer derrière le papier peint et de dissoudre l'adhésif, la fraise ayant au moins un bord coupant (24 ; 42) s'étendant au moins en partie au-delà de la limite du col (12), **caractérisé en ce que** ladite fraise est formée en un triangle découpé dans le disque le long de deux côtés et plié hors de son plan le long de son troisième côté (34). 5
2. Dispositif selon la revendication 1, **caractérisé en ce que** le troisième côté du bord coupant triangulaire (24) s'étend radialement vers l'extérieur à partir du centre du disque (30 ; 37 ; 38) ou obliquement vers l'arrière par rapport à la direction de rotation. 10
3. Dispositif selon la revendication 1 ou 2, **caractérisé en ce que** au moins une rangée d'un certain nombre de bords coupants triangulaires (24) est formée sur le disque (30 ; 37 ; 38), les troisièmes côtés desdits bords coupants s'étendant en continuation les uns des autres. 15
4. Dispositif selon la revendication 1, 2 ou 3, **caractérisé en ce que** trois rangées de bords triangulaires coupants (24) sont formées sur le disque (30 ; 37 ; 38) environ à la même distance angulaire mutuelle. 20
5. Dispositif selon la revendication 4, **caractérisé en ce qu'une** fente (35) est percée sur le disque (30 ; 37 ; 38) au niveau de chaque rangée de bords coupants triangulaires (24), ladite fente ayant un premier côté s'étendant le long du troisième côté (34) des bords coupants triangulaires et un second côté (36) situé à l'opposé et à une certaine distance du premier côté. 25
6. Dispositif selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** la hauteur des bords coupants (24 ; 42) de la fraise (30 ; 37 ; 38 ; 41) au-dessus de son plan correspond ou est légèrement inférieure à la hauteur moyenne des projections (29) sur un papier peint in grain (22). 30
7. Dispositif selon l'une quelconque des revendications 31

1 à 6, **caractérisé en ce que** la fraise (30 ; 37 ; 38 ; 41) est montée de façon détachable sur l'extrémité d'arbre (15) via une plaque de commande fixe (7) fixée sur l'extrémité d'arbre et un disque intermédiaire (5) fait d'un matériau flexible et venant en butée contre la plaque de commande via un garnissage de frottement (8) et **en ce que** la fraise est montée de façon détachable sur le disque intermédiaire via une jonction par Velcro™ (2, 6).

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8. Dispositif selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** le disque (30 ; 37 ; 38 ; 41) est en métal.

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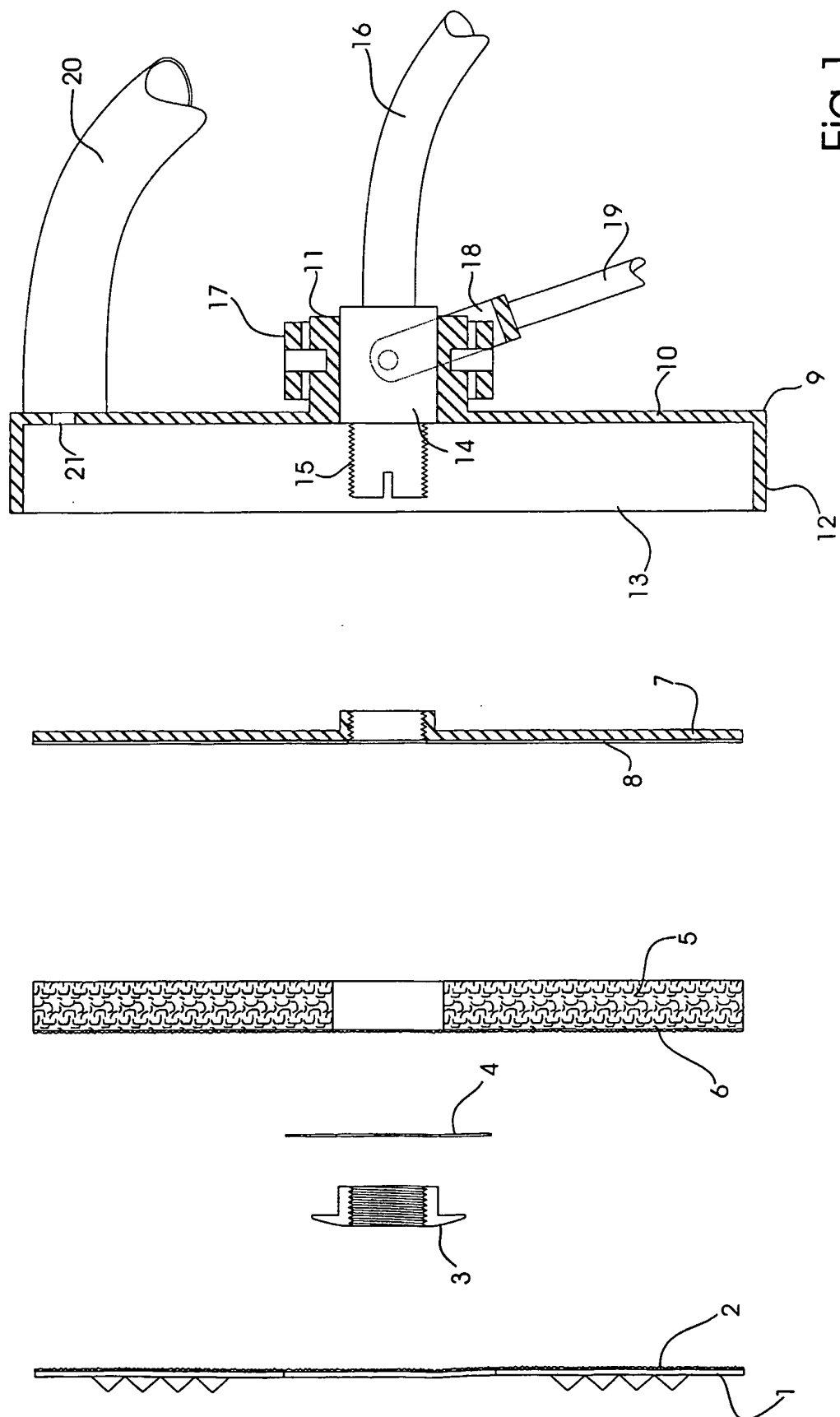
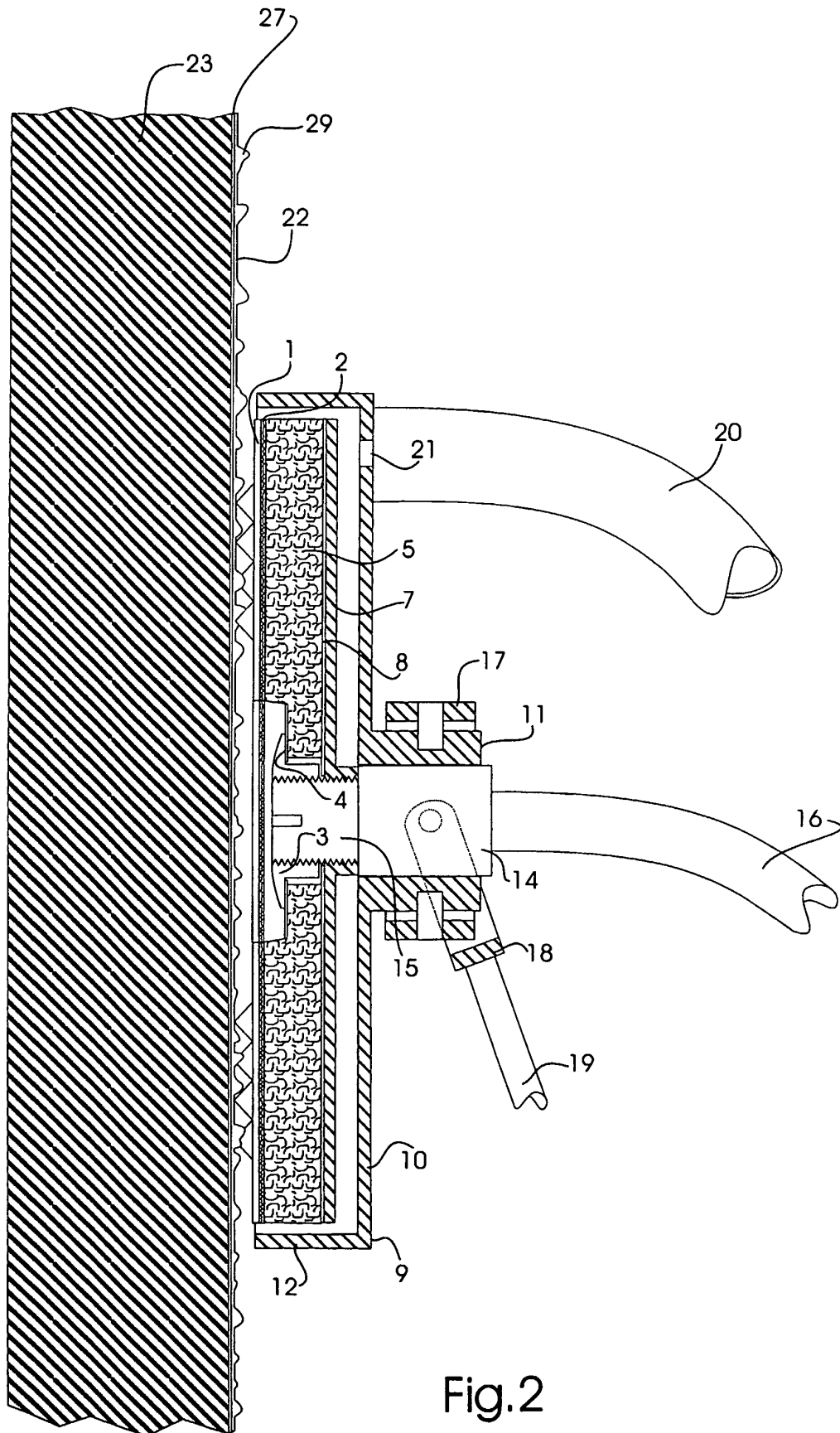


Fig. 1



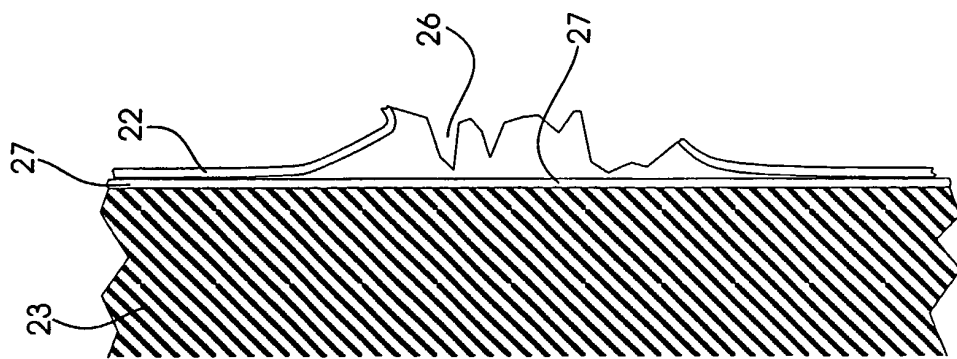


Fig. 4

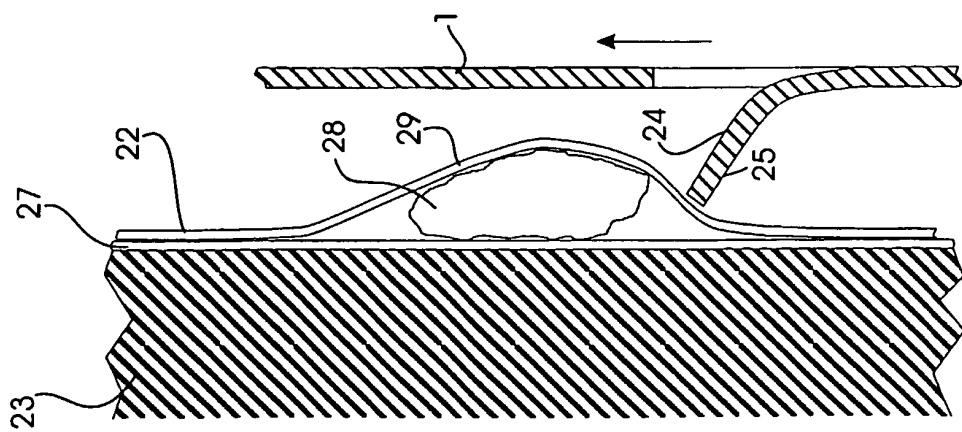


Fig. 3

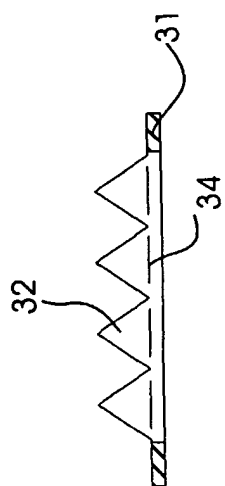
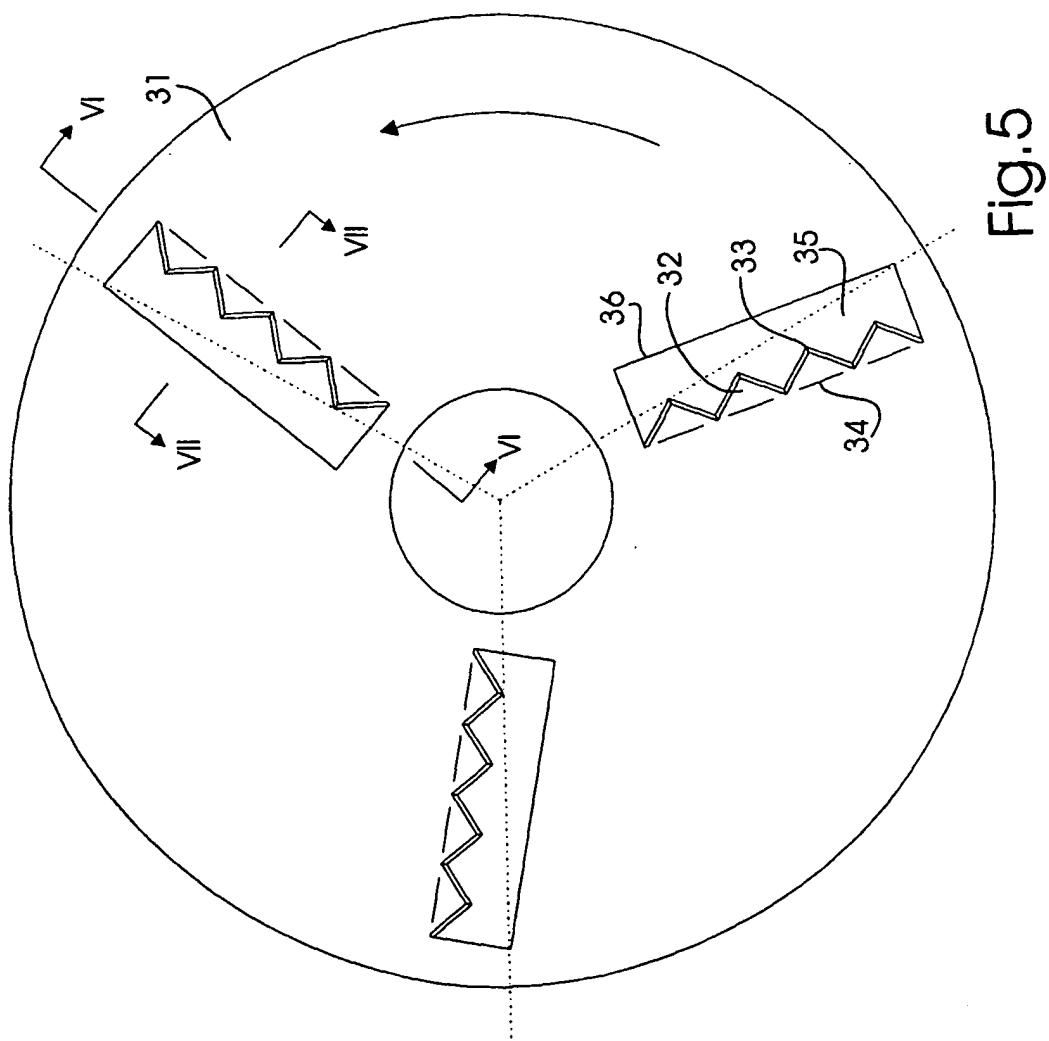
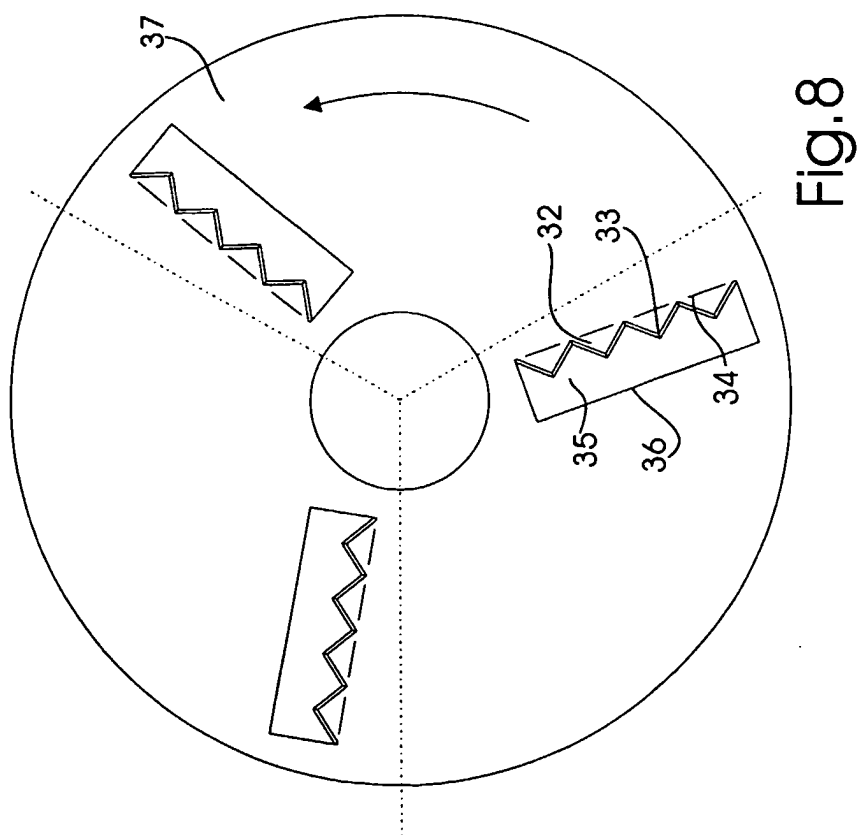
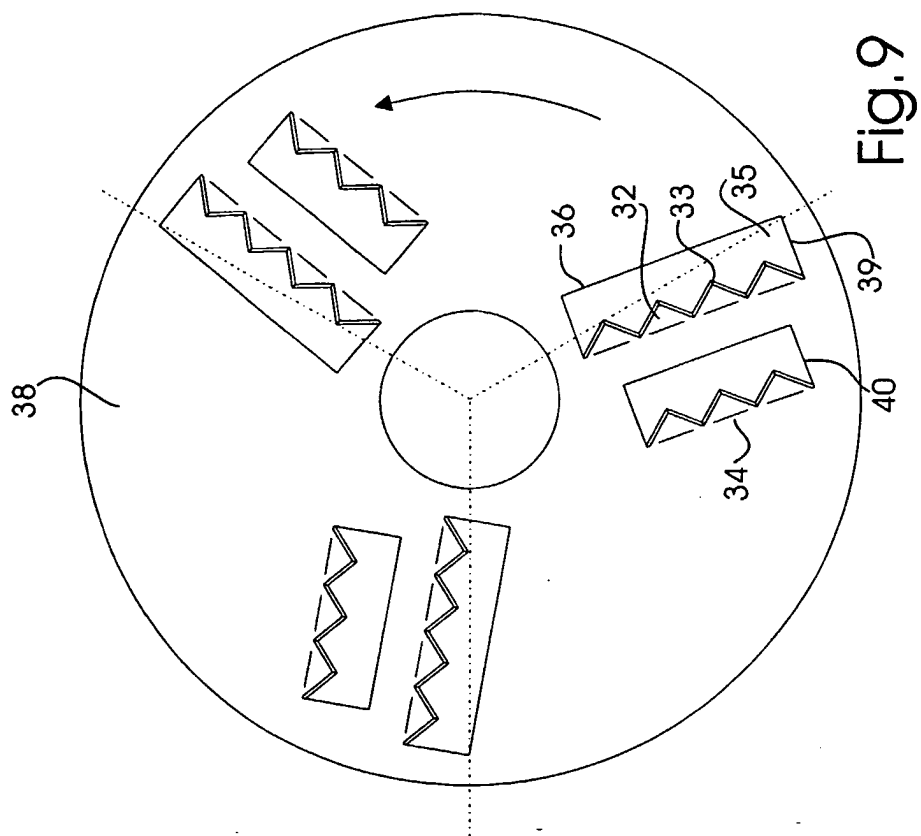


Fig. 6



Fig. 7



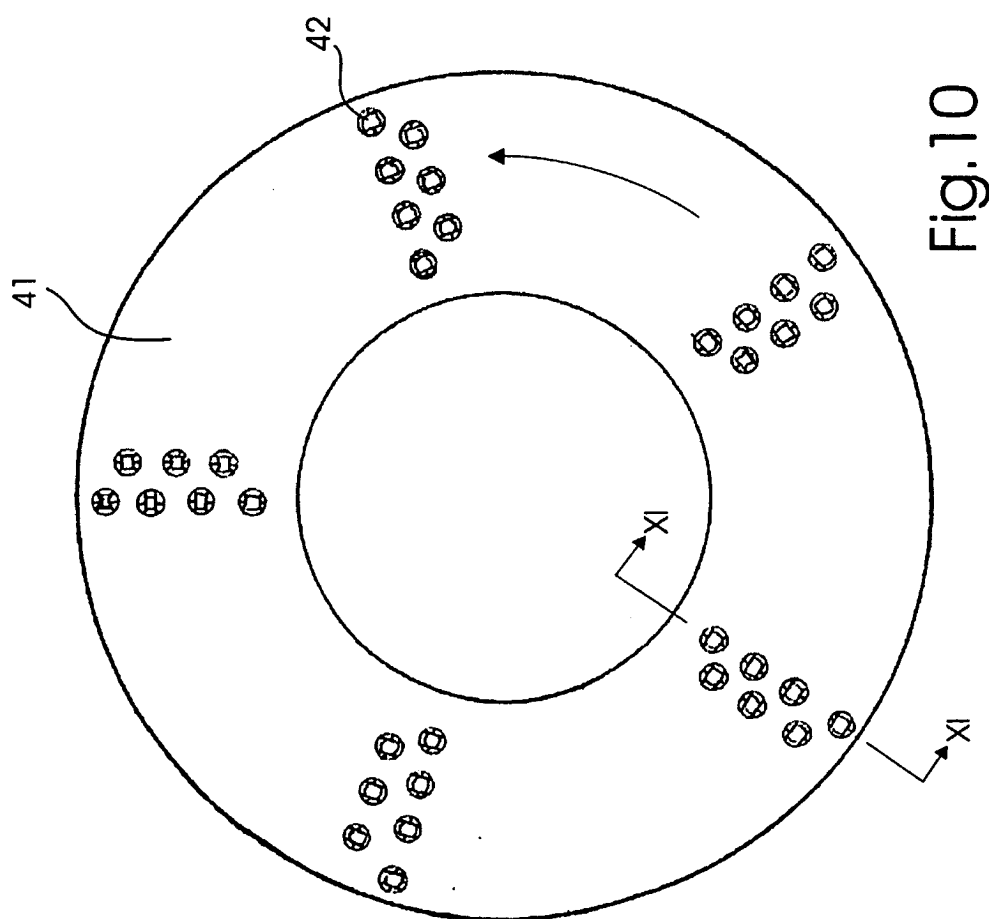


Fig. 10

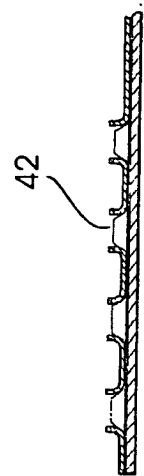


Fig. 11