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(54) **NARROW FABRICS**

BAND

TISSU POUR RUBANS

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(73) Proprietor: **Finden Coatings Limited**
Nottingham NG2 1NB (GB)

(72) Inventors:
• **FINDEN, Iain Thomas Arthur**
Nottingham NG8 1FL (GB)

• **CAIN, Miles Stephen**
Draycott, Derbyshire DE72 3PP (GB)

(74) Representative: **MacGregor, Gordon**
Eric Potter Clarkson,
Park View House,
58 The Ropewalk
Nottingham NG1 5DD (GB)

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Description

[0001] This invention relates to narrow fabrics and more particularly concerns narrow fabrics intended for use as part of a garment or appliance to be worn on part of the body of a wearer.

[0002] There have been a number of proposals for providing on narrow fabrics one or more areas of a friction-generating material which serves to assist in retaining a garment or appliance in position during wear. Generally, these proposals have been in the field of ladies hosiery, particularly relating to stockings intended to be retained in position without any external means of support.

[0003] There have been a number of proposals for providing a friction-generating material on a garment. In UK patent specification no. 1,171,063 there is described and claimed a stocking or the like wherein a support band is formed by diffusing into a portion of the fabric of the stocking a synthetic elastomeric material such as a silicone elastomer. The methods of application of the elastomeric material suggest that the resulting coating would be a wide continuous band.

[0004] UK specification no. 1,425,161 also describes a process for applying a silicone rubber material to a textile fabric garment. The process is concerned with relatively heavy duty applications such as waistbands of trousers and elasticated corsetry and employs a plurality of individual nozzles arranged to produce a product having a plurality of parallel beads of silicone rubber applied thereto.

[0005] A development of the above process is described and claimed in UK patent specification no. 2,190,018. In this process the friction-generating material is a room temperature vulcanising silicone rubber having an elongation of at least three times that of the yarn or fabric to which it is applied. The process includes contacting the coated yarn or fabric with steam and thereafter vulcanising the rubber.

[0006] UK patent specification no. 2,258,135 describes the application of a stripe of silicone material to the surface of a welt ring of a stocking and subsequently curing the silicone material. The object of the invention described and claimed in this specification is to avoid the step of attaching a separate strip of lace or braid to a stocking by applying the silicone material directly to the welt ring of a stocking.

[0007] German Patentschrift no. 666955 discloses a stocking including a thread of elastic material, the stocking including apertures which allow the skin of a wearer to enter the apertures due to the pressure applied by the elasticated material.

[0008] According to one aspect of the present invention we provide a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, said narrow fabric being provided with one or more areas of friction-generating material characterised in that said narrow fabric is an "open" fabric and a

film of friction-generating material is arranged to follow the structure of the fabric so that the film of friction-generating material exhibits a plurality of openings corresponding to openings in the fabric.

[0009] The term "narrow fabric" is intended to refer not only to fabrics falling within a strict definition as used in the textile industry but to any fabric which has a longitudinal dimension considerably greater than its lateral, or average lateral, dimension. In the context of stockings, the term narrow fabric is intended to include fabric produced on a small diameter circular knitting machine.

[0010] We have found, surprisingly, that the provision of a relatively large contact area does not, as would be expected, increase the irritation due to the prevention of exposure of the skin to atmosphere but tends to decrease the discomfort and irritation by spreading the load over a greater area and decreasing the load per unit area applied to the skin.

[0011] The use of friction-generating material in the form of a film has also been found to provide a superior holding performance, so that garments tend to stay in position for longer periods. This, combined with the improved discomfort and irritation qualities, enables garments and appliances to be worn for longer periods which is an important consideration for the wearer.

[0012] The effective surface area of the film should be relatively large as compared with the thickness. The effective surface area of the film may be limited by the lateral dimensions of the narrow fabric but the average lateral dimension of film area should be at least 25 mm, preferably 30 mm, and more preferably 35 mm. Average lateral dimensions of 35 mm to 60 mm and especially 35 mm to 50 mm have been found to be particularly advantageous.

[0013] The thickness of the film should be controlled and it is preferably substantially uniform throughout. Whilst some variation in thickness is acceptable any tendency for the variation in thickness to resemble a plurality of beads should be avoided in order to take full advantage of the invention.

[0014] The average thickness should not exceed 0.5 mm, preferably 0.3 mm, more preferably 0.2 mm. Average thickness of 0.1 mm to 0.3 mm, especially 0.15 mm to 0.25 mm have been found to be particularly advantageous.

[0015] Whilst the film may be continuous it is not necessarily so and it may be interrupted in a longitudinal or a transverse direction. It is, however, necessary that the applied friction-generating material should be in the form of a relatively thin film and the interruptions should not be such as to divide the applied material into one or more beads.

[0016] Thin films are believed to have an advantage in that they contribute less to the resilience of the coated fabric than relatively thicker beads or layers of friction-generating material and this is considered to be one of the factors in reducing the discomfort to the wearer.

[0017] The friction-generating material is preferably a

silicone elastomer and more preferably is a heat-curable silicone elastomer. Conveniently, the viscosity of the uncured silicone elastomer is 50,000 to 150,000 MPas.

[0018] The invention includes a process for producing a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, which comprises extruding a film of a curable friction-generating material onto a length of narrow fabric and curing the resultant film in situ on the fabric.

[0019] Conveniently, the narrow fabric is fed past a longitudinally stationary extrusion head.

[0020] In a modification of the invention, the film is applied to an "open" fabric and is arranged to follow the structure of the fabric so that the film of friction-generating material exhibits a plurality of openings corresponding to openings in the fabric.

[0021] Such a structure of film has many advantages. In addition to providing a reduced resilience for given film dimensions, the openings provide access for air to the body of the wearer, both factors contributing to improved comfort for the wearer. The structure also improves the aesthetic quality of the fabric in that the film is virtually invisible from the reverse side of the fabric.

[0022] It should be emphasised that not all the openings in the fabric need to have corresponding openings in the film of friction-generating material. For example, where the fabric is a lace it will usually comprise a design which will include a variety of openings of different shapes and sizes arranged in a pattern.

[0023] Openings in the film of friction-generating material will normally only correspond to the larger openings in the lace fabric and the film will be continuous in the regions of relatively smaller openings. Since these openings are relatively small the aesthetic appearance of the fabric is not adversely affected to any great extent.

[0024] According to a further aspect of the invention we provide a process for producing a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, which comprises extruding a curable friction-generating material onto a length of narrow fabric characterised in that the friction-generating material is extruded as a film and the narrow fabric is an "open" fabric having a plurality of openings therein, one or more jets of gaseous medium are directed onto the fabric in the region of the extruded film so as to produce openings in at least the areas of openings of relatively larger dimension in the fabric and curing the resultant film in situ on the fabric.

[0025] The narrow fabric having a plurality of openings therein may be a lace.

[0026] The or each jet is preferably relatively wide in comparison to its length, the width of the jet being determined by the lateral area of the fabric in which it is desired to produce openings in the film. The gas is conveniently air and is preferably comparatively dry clean air since contaminants may adversely affect the curing of the friction-generating material.

[0027] The or each jet of gas may be operated so as

to act on only selected areas of a fabric where an open structure is required.

[0028] According to another aspect of the invention we provide apparatus for producing a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer the fabric being an "open" fabric the apparatus comprising means for moving said fabric past an extrusion head and means for supplying a curable friction-generating material to said extrusion head, characterised in that the extrusion head is arranged to produce a film of material and in that a nozzle is arranged downstream of the extrusion head, said nozzle being arranged to direct jets of gas onto the fabric in the region of the extruded film to produce openings in the film corresponding to openings in the fabric.

[0029] The invention is hereinafter further described with reference to the accompanying drawings, in which-

Figure 1 is a perspective view of a lace fabric having a film of friction-generating material applied thereto; Figure 2 is a schematic plan view of an apparatus suitable for applying the film of friction-generating material to a fabric;

Figure 3 is a diagrammatic plan view of a lace fabric having a film of friction-generating material applied thereto with openings corresponding to larger openings in the fabric; and

Figure 4 is schematic plan view of a part the apparatus shown in Figure 2 with the addition of means for providing a jet of gas.

[0030] Referring to Figure 1, the fabric 10 is a stretch lace intended for attachment to the top of a stocking. A continuous film 11 of a heat-cured silicone elastomer is applied thereto. The transverse dimensions of the particular embodiment shown are: fabric: 70 mm and film 40 mm with the film thickness being constant at about 0.15 mm.

[0031] An apparatus suitable for carrying out the process is shown schematically in Figure 2. A length of narrow fabric 10 such as lace fabric, is fed continuously from a supply reel 20 to a take-up reel 24. A dry heat-curable silicone elastomer is fed from a supply chamber 21 to an extrusion head 22 which is arranged to extrude a film 11 of the heat-curable silicone elastomer onto the surface of the fabric 10.

[0032] The silicone elastomer film is cured as it passes through the curing station 23.

[0033] The product shown in Figure 3 comprises a length of stretch lace 10 having openings 12 of relatively large dimension. In the regions 13 of these relatively large openings it will be seen that the film 11 is confined to the textile material surrounding the openings whilst in the region 14 the openings are relatively small and the film is continuous.

[0034] Figure 4 is a detail showing the provision of a nozzle 41 for producing a jet of air 42 which is directed from the underside of the fabric 10 in the region of the

extrusion head 22 so that the desired openings in the film of friction-generating material are produced before the material is cured.

Claims

1. A narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, said narrow fabric being provided with one or more areas of friction-generating material **characterised in that** said narrow fabric (10) is an "open" fabric and a film (11) of friction-generating material is arranged to follow the structure of the fabric (10) so that the film of friction-generating material exhibits a plurality of openings corresponding to openings (12) in the fabric.
2. A narrow fabric according to Claim 1 **characterised in that** the average lateral dimension of film area is at least 25 mm, preferably at least 35 mm, and more preferably in the range of 35 mm to 50 mm.
3. A narrow fabric according to Claim 1 or 2 **characterised in that** the average thickness of the film does not exceed 0.5 mm, preferably 0.3 mm, more preferably 0.2 mm.
4. A narrow fabric according to any of Claims 1 to 3 **characterised in that** the friction-generating material is a heat-curable silicone elastomer.
5. A process for producing a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, which comprises extruding a curable friction-generating material onto a length of narrow fabric (10) **characterised in that** the friction-generating material is extruded as a film (11) and the narrow fabric is an "open" fabric having a plurality of openings (12) therein, one or more (42) jets of gaseous medium are directed onto the fabric in the region of the extruded film (11) so as to produce openings in at least the areas (13) of openings of relatively larger dimension in the fabric and curing the resultant film in situ on the fabric.
6. A process according to Claim 5 **characterised in that** the narrow fabric having a plurality of openings therein is a lace.
7. A process according to Claim 5 or 6 **characterised in that** the or each jet (42) is relatively wide, the width of the jet being determined by the lateral area of the fabric in which it is desired to produce openings in the film.
8. A process according to any of Claims 5 to 7 **characterised in that** the gas is air.

9. A process according to any of Claims 5 to 8 **characterised in that** the or each jet of gas may be operated so as to act on only selected areas of a fabric where an open structure is required.

10. Apparatus for producing a narrow fabric intended for use as part of a garment or appliance to be worn on part of the body of a wearer, the fabric being an "open" fabric, the apparatus comprising means for moving said fabric (10) past an extrusion head (22) and means (21) for supplying a curable friction-generating material to said extrusion head, **characterised in that** the extrusion head is arranged to produce a film of material and **in that** a nozzle (41) is arranged downstream of the extrusion head, said nozzle being arranged to direct jets of gas (42) onto the fabric in the region of the extruded film to produce openings in the film corresponding to openings (12) in the fabric.

Patentansprüche

1. Schmalgewebe, das zur Verwendung als Teil eines Bekleidungsstücks oder Funktionsstücks, welches auf einem Teil des Körpers eines Trägers zu tragen ist, vorgesehen ist, wobei das Schmalgewebe mit einem oder mehreren Bereichen aus reibungserzeugendem Material versehen ist, **dadurch gekennzeichnet, dass** das Schmalgewebe (10) ein "offenes" Gewebe ist und dass eine Schicht (11) angeordnet ist, um der Struktur des Gewebes (10) zu folgen, so dass die Schicht aus reibungserzeugendem Material eine Mehrzahl von Öffnungen zeigt, die Öffnungen (12) in dem Gewebe entsprechen.
2. Schmalgewebe nach Anspruch 1, **dadurch gekennzeichnet, dass** die mittlere Querabmessung des Schichtbereichs mindestens 25 mm, vorzugsweise mindestens 35 mm, beträgt und noch mehr bevorzugt in dem Bereich von 35 bis 50 mm liegt.
3. Schmalgewebe nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die mittlere Dicke der Schicht 0,5 mm, vorzugsweise 0,3 mm und noch mehr bevorzugt 0,2 mm nicht überschreitet.
4. Schmalgewebe nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** das reibungserzeugende Material ein hitzhärtbares Silikonelastomer ist.
5. Verfahren zur Herstellung eines Schmalgewebes, das zur Verwendung als Teil eines Bekleidungsstücks oder Funktionsstücks vorgesehen ist, welches auf einem Teil eines Körpers eines Trägers zu tragen ist, wobei das Verfahren ein Extrudieren eines härtbaren reibungserzeugenden Materials auf

einen Abschnitt Schmalgewebe (10) aufweist, **dadurch gekennzeichnet, dass** das reibungserzeugende Material als Schicht (11) extrudiert wird und dass das Schmalgewebe ein "offenes" Gewebe mit einer Mehrzahl von Öffnungen (12) darin ist, wobei ein oder mehrere (72) Strahlen aus gasförmigem Medium in dem Bereich des extrudierten Films (11) auf das Gewebe gerichtet werden, um Öffnungen in mindestens den Bereichen (13) von Öffnungen mit relativ großen Abmessungen in dem Gewebe zu erzeugen, und ein Aushärten der resultierenden Schicht in situ auf dem Gewebe.

6. Verfahren nach Anspruch 5, **dadurch gekennzeichnet, dass** das Schmalgewebe mit einer Mehrzahl von Öffnungen darin eine Spitze ist.

7. Verfahren nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** der oder jeder Strahl (72) relativ breit ist, wobei die Breite des Strahls durch den Querbereich des Gewebes bestimmt ist, in dem es erwünscht ist, Öffnungen in der Schicht zu erzeugen.

8. Verfahren nach einem der Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** das Gas Luft ist.

9. Verfahren nach einem der Ansprüche 5 bis 8, **dadurch gekennzeichnet, dass** der oder jeder Gasstrahl so betrieben werden kann, dass er nur auf ausgewählte Bereiche eines Gewebes einwirkt, in denen eine offene Struktur gefordert ist.

10. Vorrichtung zur Herstellung eines Schmalgewebes, das zur Verwendung als Teil eines Bekleidungsstücks oder Funktionsstücks vorgesehen ist, welches auf einem Teil des Körpers eines Trägers zu tragen ist, wobei das Gewebe ein "offenes" Gewebe ist, wobei die Vorrichtung Mittel zum Bewegen des Gewebes (10) an einem Extrusionskopf (22) vorbei und Mittel (21) zum Zuführen eines härtbaren reibungserzeugenden Materials zu dem Extrusionskopf aufweist, **dadurch gekennzeichnet, dass** der Extrusionskopf angeordnet ist, um eine Schicht aus Material zu erzeugen und dass eine Düse (41) stromab des Extrusionskopfs angeordnet ist, wobei die Düse angeordnet ist, um Gasstrahlen (42) auf das Gewebe in dem Bereich der extrudierten Schicht zu richten, um Öffnungen in der Schicht entsprechend den Öffnungen (12) in dem Gewebe zu erzeugen.

Revendications

1. Tissu pour rubans destiné à être utilisé comme une partie d'un habit ou un équipement devant être porté sur une partie du corps d'un utilisateur, ledit tissu

pour rubans étant doté d'une ou plusieurs zones de matériau engendrant un frottement, **caractérisé en ce que** ledit tissu pour rubans (10) est un tissu « ouvert » et un film (11) en matériau engendrant un frottement est agencé de manière à suivre la structure du tissu (10) afin que le film en matériau engendrant un frottement présente une pluralité d'ouvertures correspondant à des ouvertures (12) dans le tissu.

2. Tissu pour rubans selon la revendication 1, **caractérisé en ce que** la dimension latérale moyenne de la zone de film est d'au moins 25 mm, de préférence au moins 35 mm, et de manière encore plus préférable comprise entre 35 et 50 mm.

3. Tissu pour rubans selon la revendication 1 ou 2, **caractérisé en ce que** l'épaisseur moyenne du film ne dépasse pas 0,5 mm, de préférence 0,3 mm, et de manière encore plus préférable 0,2 mm.

4. Tissu pour rubans selon les revendications 1 à 3, **caractérisé en ce que** le matériau engendrant un frottement est un élastomère de silicone thermodurcissable.

5. Procédé de fabrication d'un tissu pour rubans destiné à être utilisé en tant que partie d'un vêtement ou équipement devant être porté sur une partie du corps d'un utilisateur, lequel comprend l'extrusion d'un matériau durcissable engendrant un frottement sur une longueur de tissu pour rubans (10), **caractérisé en ce que** le matériau engendrant un frottement est extrudé sous la forme d'un film (11) et le tissu pour rubans est un tissu « ouvert » comprenant une pluralité d'ouvertures (12), un ou plusieurs (42) jets de matière gazeuse sont dirigés sur le tissu dans la région du film extrudé (11), de manière à produire des ouvertures dans au moins les zones (13) où les ouvertures sont de dimensions sensiblement supérieures dans le tissu et de manière à faire durcir le film qui en résulte directement sur le tissu.

6. Procédé selon la revendication 5, **caractérisé en ce que** le tissu pour rubans ayant une pluralité d'ouvertures est de la dentelle.

7. Procédé selon la revendication 5 ou 6, **caractérisé en ce que** le jet ou chaque jet (42) est relativement large, la largeur du jet étant déterminée par la zone latérale du tissu dans lequel les ouvertures doivent être réalisées dans le film.

8. Procédé selon l'une quelconque des revendications 5 à 7, **caractérisé en ce que** le gaz est de l'air.

9. Procédé selon l'une quelconque des revendications

5 à 8, **caractérisé en ce que** le jet ou chaque jet de gaz peut être actionné de manière à n'agir que sur des zones sélectionnées d'un tissu dans lequel une structure ouverte est requise.

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10. Appareil de fabrication d'un tissu pour rubans destiné à être utilisé comme une partie d'un habit ou un équipement destiné à être porté sur une partie du corps d'un utilisateur, le tissu étant un tissu « ouvert », l'appareil comprenant des moyens permettant de déplacer ledit tissu (10) au delà d'une tête d'extrusion (22) et des moyens (21) permettant de fournir un matériau durcissable engendrant un frottement à ladite tête d'extrusion, **caractérisé en ce que** la tête d'extrusion est agencée de manière à produire un film de matériau et **en ce qu'**une tuyère (41) est agencée en aval de la tête d'extrusion, ladite tuyère étant agencée pour diriger les jets de gaz (42) sur le tissu dans la région du film extrudé afin de réaliser des ouvertures dans le film correspondant aux ouvertures (12) dans le tissu.

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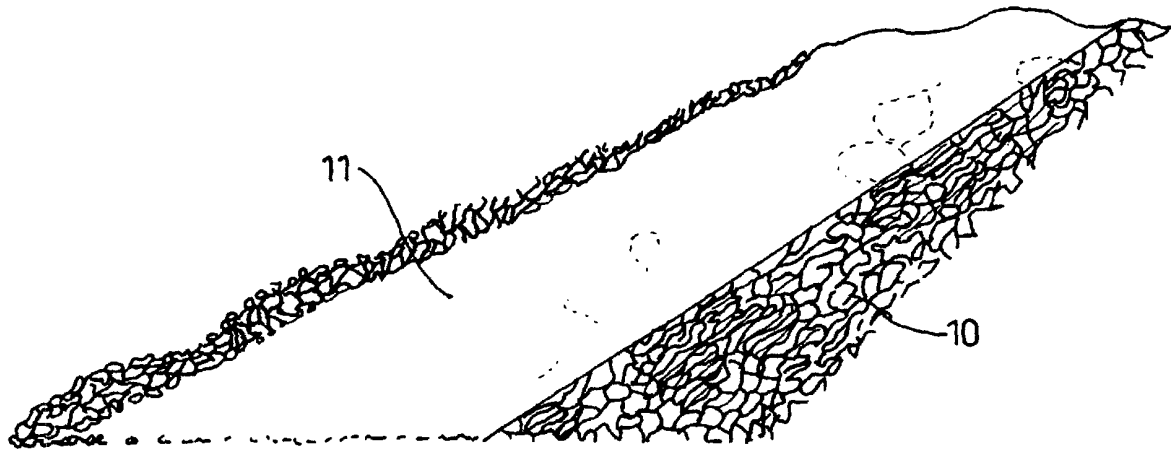


Fig. 1

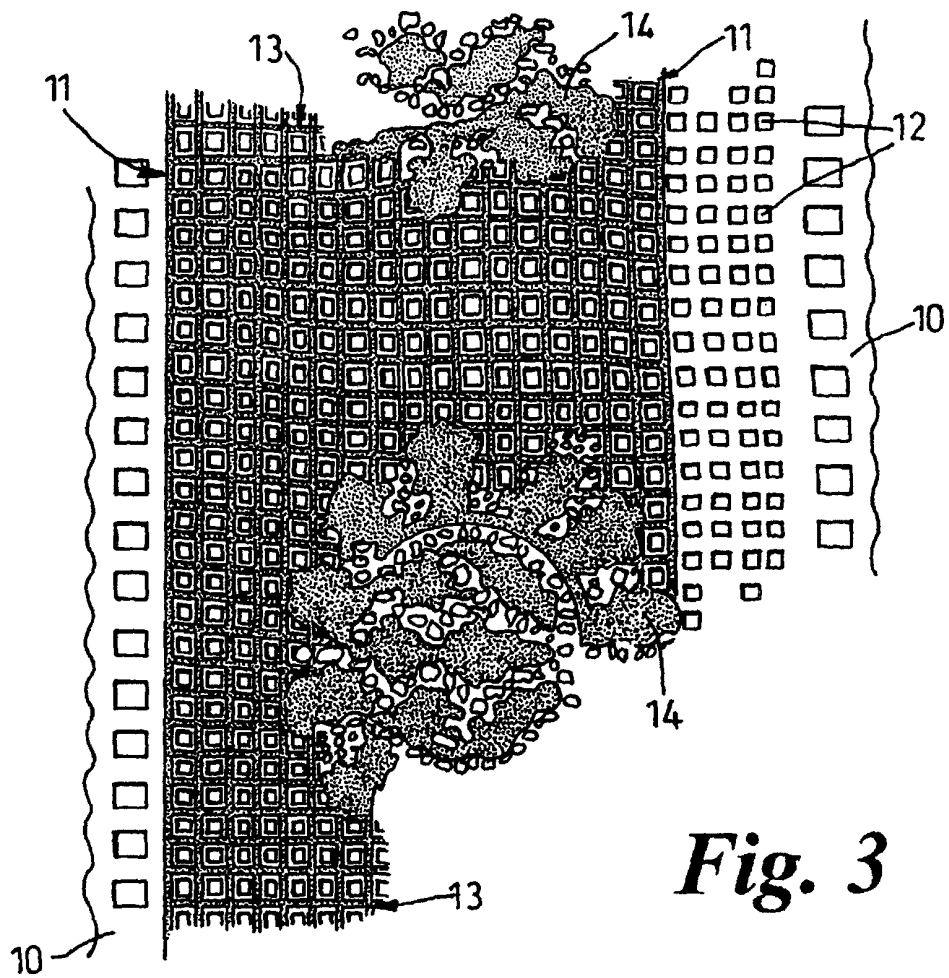


Fig. 3

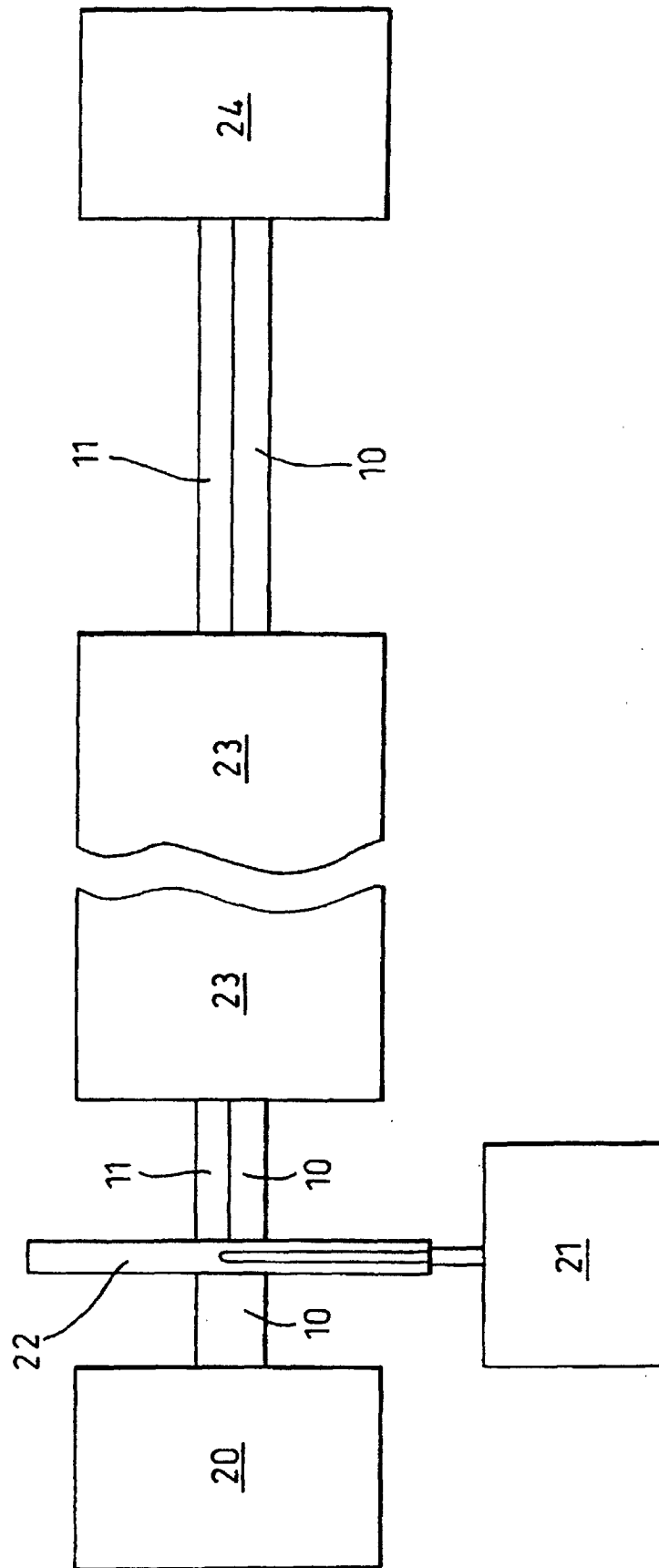


Fig. 2

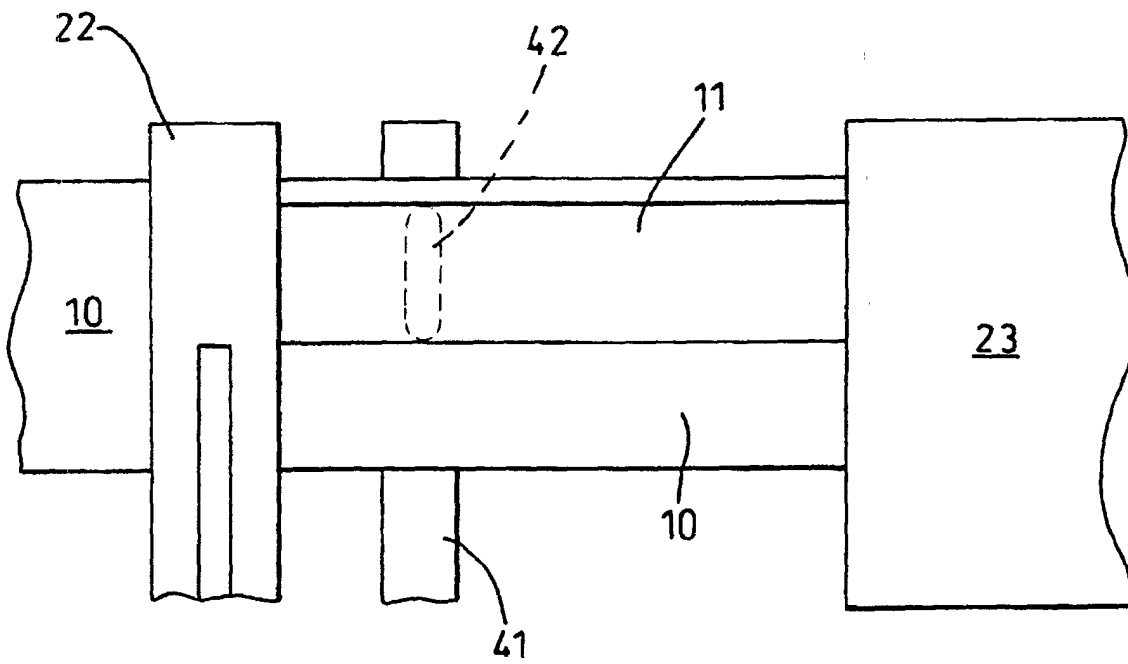


Fig. 4