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(71) Applicant: **Tetrao, Sabrina**
10123 Torino (IT)

(72) Inventor: **Tetrao, Sabrina**
10123 Torino (IT)

(74) Representative: **Garavelli, Paolo**
A.BRE.MAR. S.R.L.,
Via Servais 27
10146 Torino (IT)

(54) Horizontally-supported flexible panel

(57) An horizontally-supported flexible panel (1) is described, comprising: at least two side supporting members (3, 5) for supporting the panel (1) without exploiting the force of gravity by using pulling and friction forces; and as an option, at least two connecting members (7, 9) which connect every side supporting member (3, 5) to the panel (1) in such a way that the panel (1) is kept in its operating position by the pulling action exerted on it by the connecting members (7, 9) connected to the supporting members (3, 5), and in such a way that the connecting members (7, 9) also exert a friction force on the supporting members (3, 5) which allows their forced sliding, but prevents their free sliding on the supporting members (3, 5) themselves.

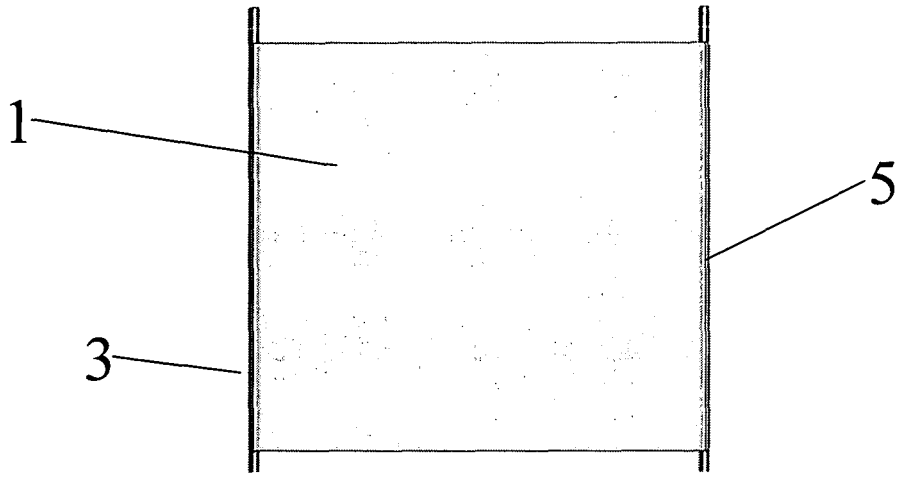

FIG. 1

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Description

[0001] The present invention refers to a horizontally-supported flexible panel, in particular for furnishing environments when it is used as window curtain or door/window, projection screen, support for printouts, separating device, screen and the like.

[0002] The present invention will be described herein below in its application as window curtain, but it is obvious that it can be applied equally efficiently for all known and future furniture panel applications.

[0003] Currently known window curtains exploit, for their operating arrangement, the gravity force, being connected on their upper part to substantially horizontal connecting and supporting members, and being kept in a stretched position by their own weight or by weights applied thereto and usually placed in their lower part.

[0004] No curtains are instead known which do not need the gravity force to be installed and operated between their opening position (curtain which is completely bent onto itself, or laterally displaced with respect to the window) and their closing position (curtain which is completely stretched or displaced for protecting and covering the window).

[0005] Object of the present invention is therefore providing a flexible panel, for example a curtain, which can be installed without using gravity, is of a simple realisation and installation and with reduced costs, and allows, through its above-mentioned characteristics, to be moved in a plurality of positions which is much greater than the ones allowed by currently known panels and curtains.

[0006] The above and other objects and advantages of the invention, as will result from the following description, are obtained by a flexible panel as claimed in claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0007] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a front view of a curtain-type embodiment of the flexible panel according to the present invention;
- Figures 2 and 3 are perspective views of some operating positions of a variation of the curtain in Fig. 1;
- Figures 4 to 9 are front views of some operating positions of the curtain in Fig. 1;
- Figures 10 to 17 are front views of some operating positions of the curtain in Fig. 2 and 3; and
- Figures 18 to 22 are views of variations of embodiments of the connecting members of the panel of the present invention.

[0008] With reference to the Figures, a preferred embodiment of the flexible panel of the present invention is shown and described. It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to the described panel, without departing from the scope of the invention as appears from the enclosed claims.

[0009] According to the Figures, the horizontally-supported flexible panel 1 of the invention substantially comprises at least two side supporting members 3, 5 connected to the panel 1 on two of its sides, in which such side supporting members 3, 5 are adapted to support the panel 1 without exploiting the force of gravity but using pulling and friction forces.

[0010] In a variation of its configuration, the panel 1 further comprises at least two connecting members 7, 9, which connect every side supporting member 3, 5 to the panel 1 in such a way that the panel 1 is kept in its operating position by the pull exerted thereon by the connecting members 7, 9 connected to the side supporting members 3, 5, and in such a way that the connecting members 7, 9 also exert a friction force on the side supporting members 3, 5 which allows their forced sliding, but prevents their free sliding on the side supporting members 3, 5.

[0011] With this arrangement, the inventive flexible panel 1 is therefore adapted to assume a plurality of operating positions which change from the one in which it is completely stretched to the one in which it is completely bent on itself, passing from intermediate positions in which it is partially stretched and partially bent.

[0012] In particular, as shown, such side supporting members 3, 5 are composed of two pipes, preferably metal pipes. Such side supporting members 3, 5 are commonly mutually parallel and vertically placed with respect to the ground, but can assume any useful configuration and arrangement (see for example Fig. 2), such as for example a position in which they are mutually slanted in order to realise mutually convergent or divergent positions.

[0013] In this way, independently from the fact that the panel 1 is secured vertically, horizontally or in any intermediate position or inclination at will, a positioning freedom of the panel 1 is thereby guaranteed in a fantasy and not necessarily simmetrical way.

[0014] The inventive panel 1 can be used in various ways: for example, but not in a limiting way, if it is equipped with suitable supports for securing it to a wall, it can be used as window curtain, projection screen, support for a printout and the like; or, if it is secured with pressure between floor and ceiling, it can be used as door/window curtain, separating member/screen and the like.

[0015] The system for securing the panel to pipes which exploits the above principle can be realised in various ways, some of which will be described herein below, in an absolutely non-limiting and exemplifying way.

[0016] For example, as shown in Fig. 4 to 9, the panel 1 can be composed of elastic fabric, whose size is ap-

proximately double with respect to the distance between the side supporting members 3, 5 (while the other size has no importance with respect to its operation), and is adapted to be placed around the side supporting members 3, 5, the two end edges of the panel 1 being closed through closing means 14 such as zips, buttons, laces, hooks, poussoirs and others. The tension of the panel 1 fabric and its friction on side supporting members 3, 5 guarantee the holding and its placement at various, even slightly asymmetrical heights.

[0017] This system is very practical, allows using any tissue provided it is elastic or bi-elastic, and allows obtaining particular effects by unhooking some fasteners 14 (buttons, laces, etc.).

[0018] The panel 1 can be moved simply with the hands, by making the fabric slide along the pipes 3, 5.

[0019] According to a variation shown in Fig. 10 to 17, the panel has a size of about 3 cm on every lower part with respect to the distance of the two pipes 3, 5 (the other size has no importance for its operation) and is connected to the pipes with bands made of elastic material 7, 9 through holding means (not shown) such as poussoirs, buttons, Velctro® and the like. The band 7, 9 made of elastic material guarantees the tension, while the coating made of high-density fabric guarantees its friction and its pleasant sliding. Disconnecting the panel 1 for washing it is thereby easy.

[0020] This system allows placing the panel 1 in many positions among which the one which looks like the classical "package" and other, even asymmetrical positions, as can be better seen in the Figures, in which the operating positions reached are obtained by resting the hands on the elastic bands 7, 9 in order to make them slide in the desired position.

[0021] According to another variation of the inventive panel 1, it has a size of about 3 cm for every lower part with respect to the distance of the two pipes 3, 5 (the other size has no importance for its operation) and is drilled on the two sides which are parallel to pipes 3, 5. An elastic 7, 9 anchored to the panel 1 hole and passing into the pipe 3, 5, guarantees both tension and friction.

[0022] This system allows placing the panel 1 in many positions, among which the one which lookslike the classical "package" and other, even asymmetrical positions.

[0023] A side tongue 16 on the elastic 7, 9 guarantees its easy movement at various heights.

[0024] Finally, as further non-limiting variation of the panel 1 of the present invention, it has a size of about 3 cm for every lower part with respect to the distance of the two pipes 3, 5 (the other size has no importance for its operation) and is drilled on the two sides parallel to pipes 3, 5. A spring 7, 9 is connected to a member 20 which slides on the pipe 3, 5. The spring 7, 9 (which can be replaced by an elastic or any other mechanism subjected to an elastic force) guarantees its tension.

[0025] The sliding member 20 uses the friction force to be placed at various heights, and can be realised in a variety of ways, such as for example:

a. hollow cylinder 20 with securing eyelet 24, internally coated with a fabric 22 with very fine weft which, by interfering with the pipe 3, 5 generates friction. The fabric 22 is secured to the hollow cylinder 20 through adhesive.

b. hollow frustum of cylinder 20 with securing eyelet 24, internally coated first with a magnetic rubber (for example Magneti Plastoflex® X5), then with fabric 22 (to avoid "clogging"). The magnete guarantees the interference and therefore material friction with the pipe 3, 5.

Claims

1. Horizontally-supported flexible panel (1) **characterised in that** it comprises at least two side supporting members (3, 5) connected to said panel (1) on two of its sides, said side supporting members (3, 5) being adapted to support said panel (1) without exploiting the force of gravity but using pulling and friction forces.

2. Flexible panel (1) according to claim 1, **characterised in that** it further comprises at least two connecting members (7, 9), said connecting members (7, 9) connecting every side supporting member (3, 5) to said panel (1) in such a way that said panel (1) is kept in its operating position by the pulling action exerted on it by the connecting members (7, 9) connected to the side supporting members (3, 5), and in such a way that said connecting members (7, 9) also exert a friction force onto said side supporting members (3, 5) which allows their forces sliding, but prevents their free sliding on said side supporting members (3, 5).

3. Flexible panel (1) according to claim 1 or 2, **characterised in that** said panel (1) is adapted to assume a plurality of operating positions which change from the one in which it is completely stretched to the one in which it is completely bent onto itself, passing from intermediate positions in which it is partially stretched and partially bent.

4. Flexible panel (1) according to claim 1 or 2, **characterised in that** said side supporting members (3, 5) are composed of two pipes.

5. Flexible panel (1) according to claim 1 or 2, **characterised in that** said side supporting members (3, 5) are mutually parallel and vertically placed with respect to the ground.

6. Flexible panel (1) according to claim 1 or 2, **characterised in that** said side supporting members (3, 5) are mutually slanted in order to realise mutually convergent or divergent positions.

7. Flexible panel (1) according to claim 1 or 2, **characterised in that** it is composed of an elastic fabric, whose size is approximately double with respect to the distance between said side supporting members (3, 5), and it is placed around said side supporting members (3, 5), the two end edges of said panel (1) being closed through closing means (14) such as zips, buttons, laces, hooks, poussoirs and others, the tension of the panel (1) fabric and its friction on the side supporting members (3, 5) guaranteeing holding and placement at various, even sligthly asymmetrical heights.

8. Flexible panel (1) according to claim 2, **characterised in that** said connecting members (7, 9) are composed of bands made of elastic material and holding means, such as poussoirs, buttons, Velcro® and the like.

9. Flexible panel (1) according to claim 2, **characterised in that** said connecting members (7, 9) are composed of an elastic anchored to a hole obtained in said side supporting members (3, 5), said elastic (7, 9) being equipped with a side tongue (16) adapted to allow moving said elastic (7, 9) and consequently said panel (1) at various heights.

10. Flexible panel (1) according to claim 2, **characterised in that** said connecting members (7, 9) are composed of a spring, or similar elastic means, connected to a cylindrical member (20) placed around and sliding on said side supporting members (3, 5), said cylindrical member (20) being further equipped with friction means (22) adapted to allow its forced sliding, but to prevent its free sliding on said side supporting members (3, 5).

11. Flexible panel (1) according to claim 10, **characterised in that** said cylindrical member (20) is composed of an hollow cylinder with an eyelet (24) for securing said spring (7, 9), said cylinder (20) being internally coated with a fabric with very fine weft adapted to generate friction by interference with said supporting members (3, 5), said fabric being secured to said hollow cylinder (20) through adhesive.

12. Flexible panel (1) according to claim 10, **characterised in that** said cylindrical member (20) is composed of a hollow frustum of cylinder with an eyelet (24) for securing said spring (7, 9), said frustum of cylinder (20) being internally coated first with a magnetic rubber, and then with fabric.

13. Flexible panel (1) according to any one of the previous claims, **characterised in that** said supporting members (3, 5) are adapted to be secured to a wall, said panel (1) being adapted to be used as window curtain, projection screen, support for a printout and the like.

14. Flexible panel (1) according to any one of the previous claims, **characterised in that** said supporting members (3, 5) are adapted to be secured with pressure between a floor and a ceiling, said panel (1) being adapted to be used as door/window curtain, dividing member/screen and the like.

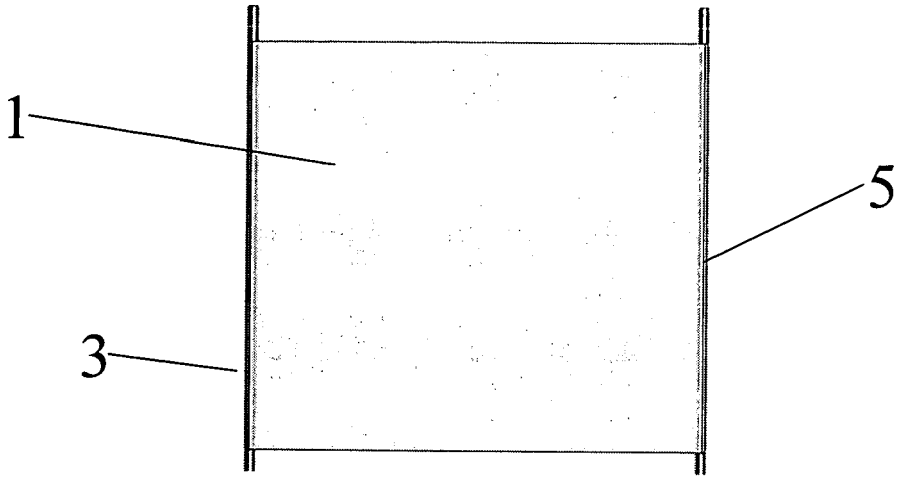

FIG. 1

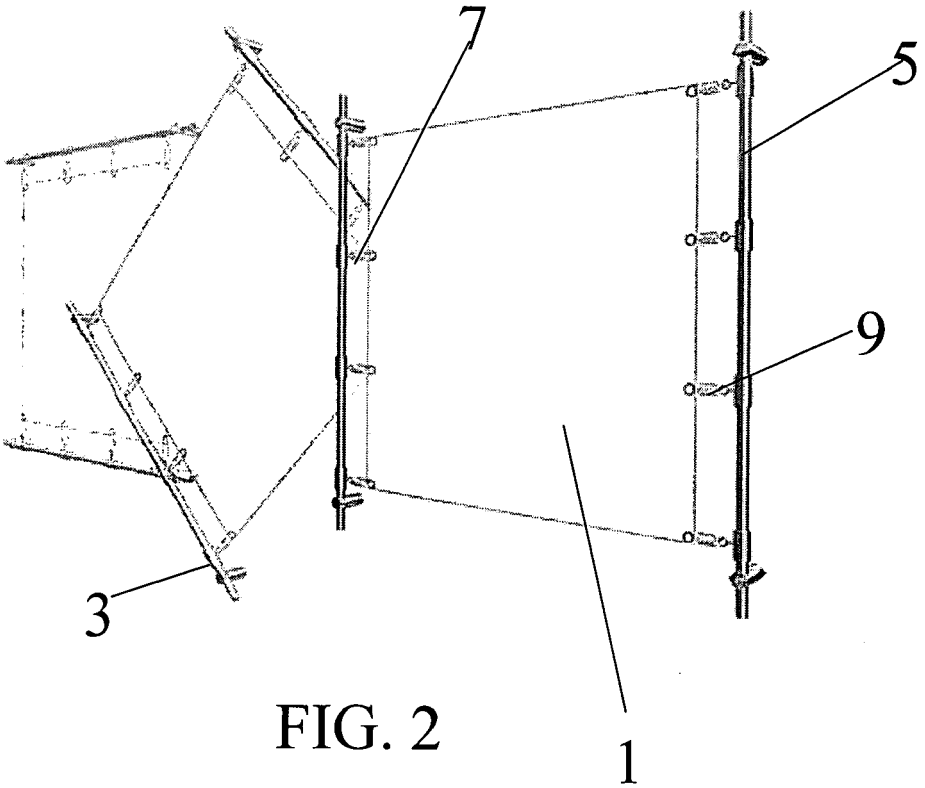

FIG. 2

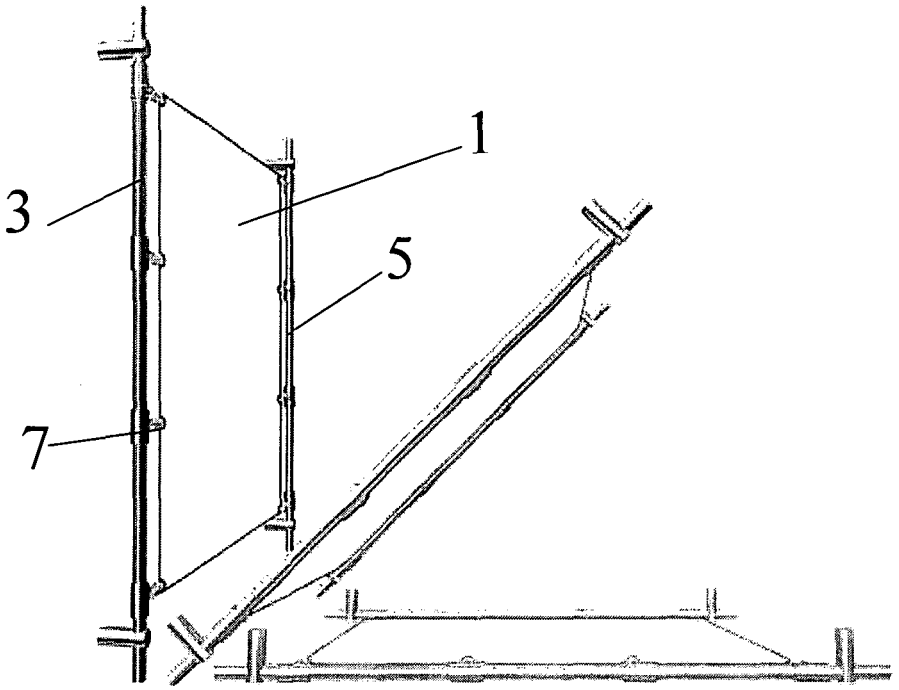

FIG. 3

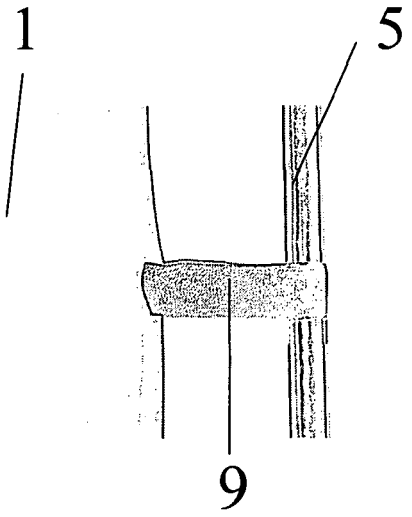

FIG. 18

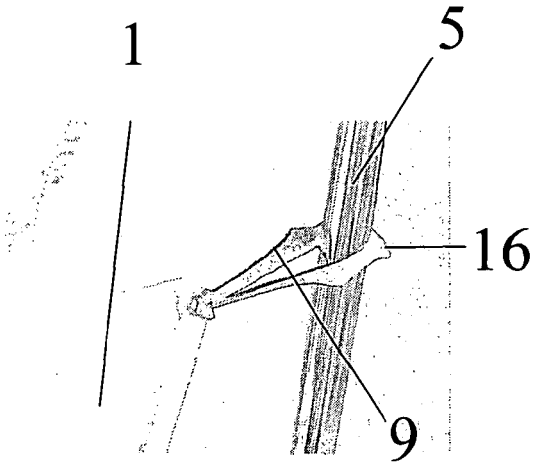

FIG. 19

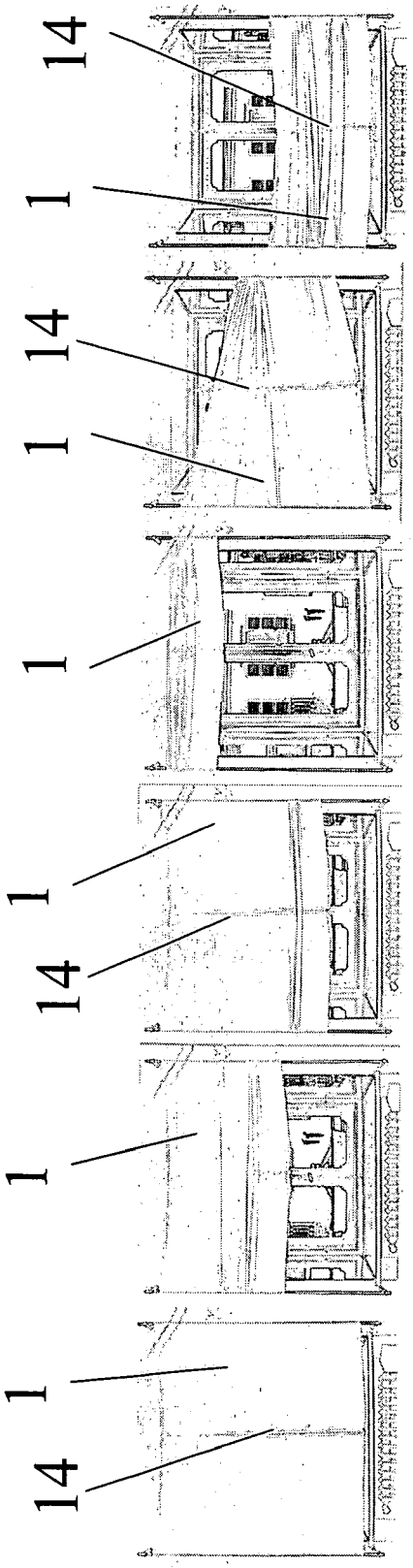

FIG. 4 FIG. 5 FIG. 6 FIG. 7 FIG. 8 FIG 9

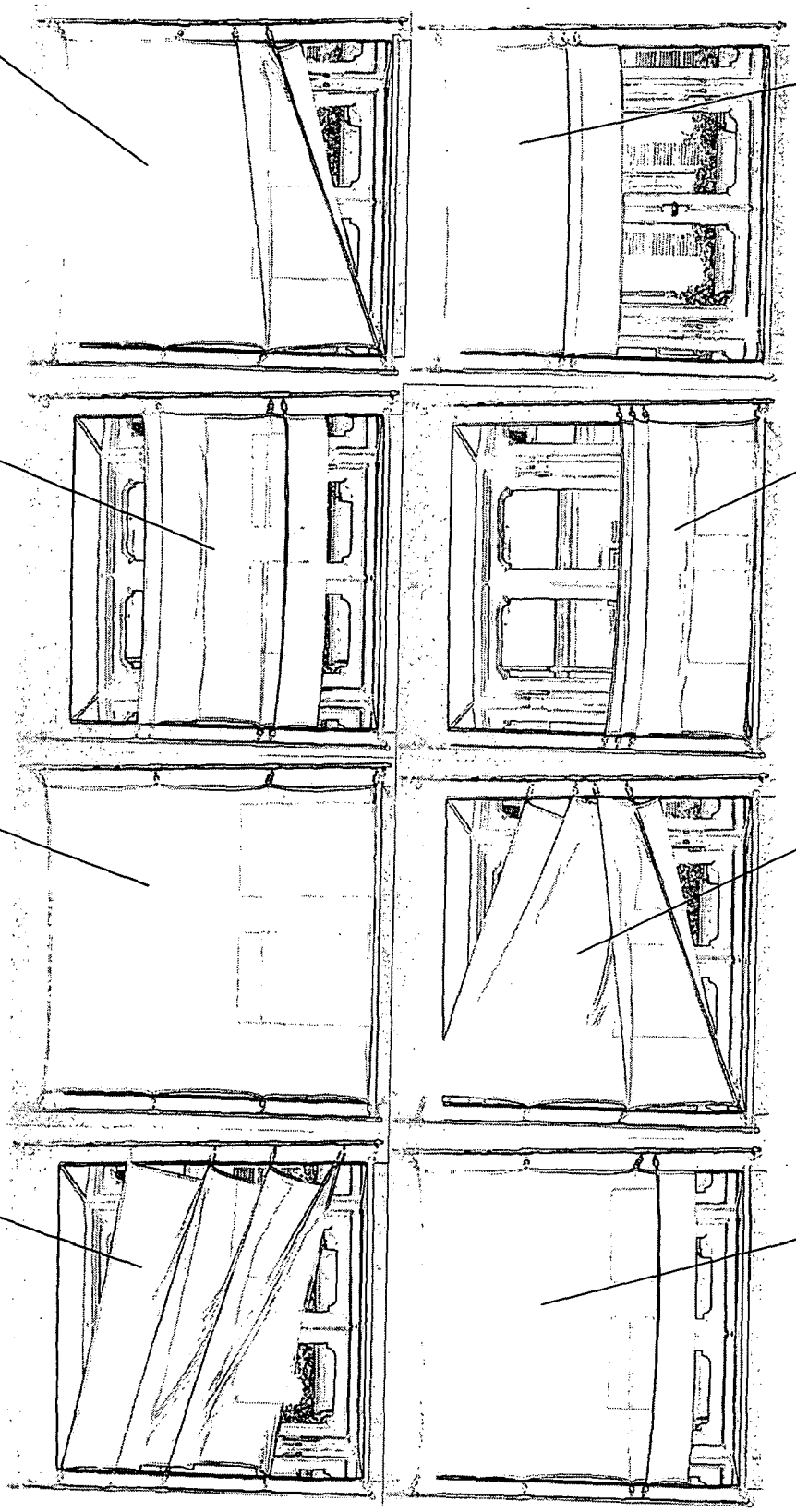
FIG. 10 1
FIG. 11 1
FIG. 12 1
FIG. 13 1
FIG. 14 1
FIG. 15 1
FIG. 16 1
FIG. 17 1

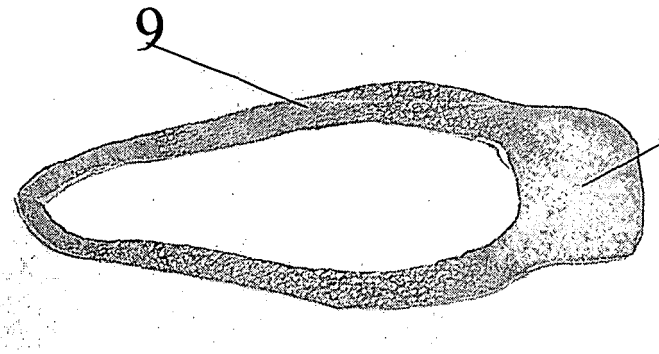

FIG. 20

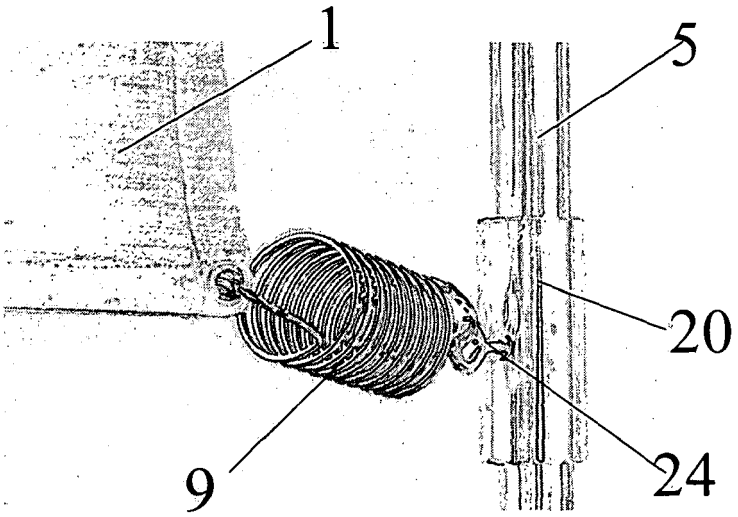

FIG. 21

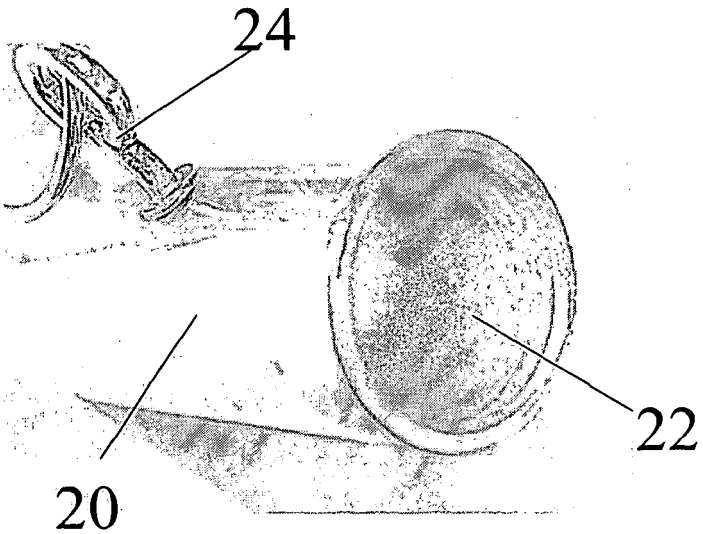

FIG. 22