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(54) **Venetian blind apparatus**

(57) The invention relates to a venetian blind, comprising: a plurality of parallel and horizontally extending slats which are mutually connected by means of suspension means, and gathering means for gathering the slats together into a package, wherein the gathering

means are adapted to form the package on the upper part of the venetian blind, wherein a cleaning device is arranged for cleaning the slats, wherein the cleaning device is arranged on the upper part of the venetian blind below the position where the package of slats is formed.

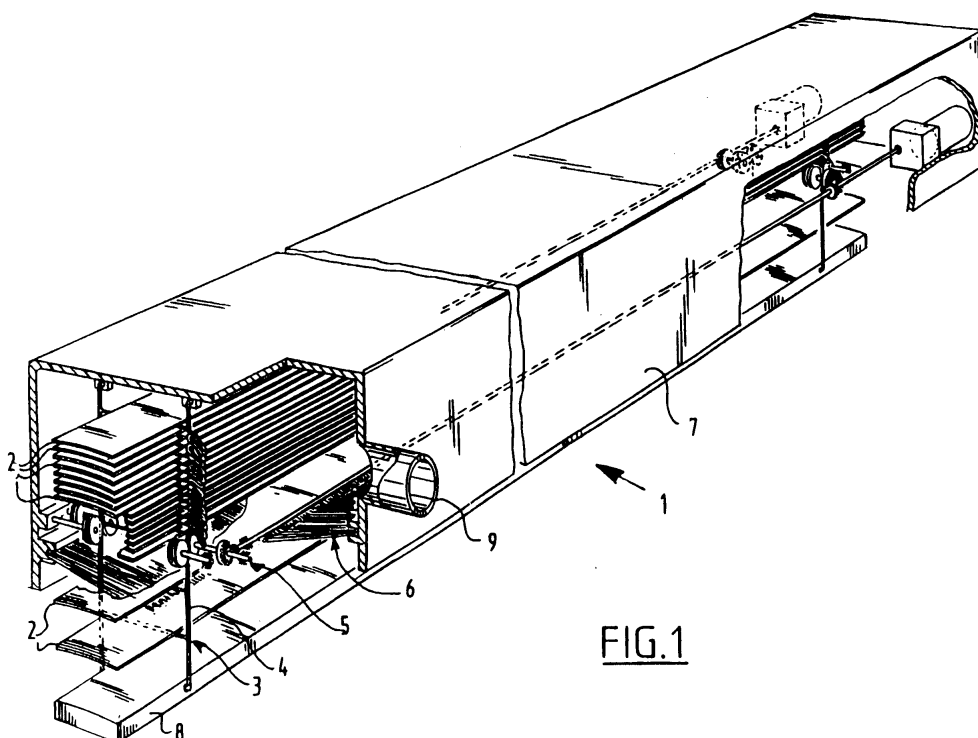


FIG.1

Description

[0001] The invention relates to a venetian blind, comprising: a plurality of parallel and horizontally extending slats which are mutually connected by means of suspension means, and gathering means for gathering the slats together into a package, wherein the gathering means are adapted to form the package on the upper part of the venetian blind.

[0002] Such a venetian blind is already known from EP-A-0 140 103 and US-A-1 929 071.

[0003] It is noted that in the case of a venetian blind the position of the package of slats generally changes during opening or closing of the blind and the package respectively increases or decreases in size, which causes rapid wear, particularly in respect of the suspension means.

[0004] The slats of the known venetian blinds are highly susceptible to dirtying, partly due to the nature of the material from which the slats are manufactured. Currently, these slats must be cleaned manually, which is a difficult and time-consuming operation.

[0005] The invention has for its object to obviate the above stated drawbacks and provides for this purpose a venetian blind apparatus which is distinguished in that the venetian blind is provided with a cleaning device for cleaning the slats, wherein this cleaning device is arranged on the upper part of the venetian blind below the position where the package of slats is formed.

[0006] Since the slats retain a determined mutual spacing until they are collected into a package, a cleaning device according to the invention can clean each slat for a determined time and do so at each passage of the slat, and each slat will thus be cleaned during closing and opening of the blind. In this manner the difficult, manually performed cleaning operations known heretofore are carried out automatically by a venetian blind according to the invention.

[0007] The venetian blind according to the invention is further elucidated with reference to the figure description following hereinbelow of a number of preferred embodiments. In the drawing:

figure 1 shows a partly broken away perspective view of an embodiment of a venetian blind according to the present invention;

figure 2 shows in greater detail the gathering means of the embodiment of the present invention shown in figure 1;

figure 3 shows a partly broken away perspective view of another embodiment of a venetian blind according to the present invention;

figure 4 is a partly broken away perspective view of the gathering means of another embodiment of the venetian blind according to the present invention;

figures 5 to 7 show embodiments for the suspension means for mutually connecting the slats which are adapted for use in a venetian blind according to the

invention;

figure 8 is a partly broken away perspective view of a housing for stowing the package of slats.

[0008] Figure 1 shows a preferred embodiment of a venetian blind 1 according to the invention. The blind 1 comprises a plurality of parallel extending and mutually connected slats 2 and suspension means 3 which, as shown in the drawing, consist substantially of a ladder cord 4, the so-called rungs of which are connected to slats 2. The use of such a ladder cord 4 allows tilting of the slats 2. Blind 1 also comprises gathering means 5 for gathering slats 2 together to form a package. These gathering means 5 are shown in greater detail in figure 2.

[0009] Blind 1 is provided with a cleaning device 6 which, as is shown clearly in the drawing, is arranged just below the upper part of the blind where package forming of slats 2 takes place. Blind 1 likewise comprises a housing 7 which, when slats 2 have all been collected into a package, is closed by the bottom slat 8. A connecting element 9 may also be provided for connecting the cleaning device 6 of brushes to a vacuum cleaner (not shown). These brushes may also be adapted as round, rotating dirt collecting means.

[0010] Figure 2 shows in greater detail the gathering means 5 of the venetian blind shown in figure 1. Gathering means 5 consist substantially of a plurality of rods and toothed wheels which are driven by an electric motor (not shown) or manually via drive rods 14, 15. Gathering means 5 comprise two pairs of transporting wheels 10, 11 and 12, 13 respectively. These transporting wheels are driven by drive rods 14 and 15 which transmit their moment via a plurality of bevel gear wheels 16, 17, 18 and 19. Because the slats 2 are formed into a package, loops 20 are created in the upright parts of ladder cord 4.

[0011] It will be apparent that a venetian blind with gathering means as shown in figures 1 and 2 cause formation of a package of slats at a fixed position on the upper part. Each slat can hereby be cleaned automatically during the passage through cleaning device 6.

[0012] Figure 3 shows another preferred embodiment of a venetian blind 21 according to the invention. Slats 22 and the bottom slat 23 are mutually connected by suspension means 24. These latter consist substantially of a ladder cord, which ladder cord is provided on uprights 25 with apertures 26 at regular mutual interspacing. Blind 21 is likewise provided with a cleaning device consisting substantially of a plurality of brushes 27. Blind 21 likewise comprises gathering means 28 with two toothed wheels 29 and 30 for engaging the uprights 25 of the ladder cord. A guide 31 is partially open whereby slats 22 can be collected into a package and stowed in a housing 32. Because the guide is partially open the slats can assume a tilted position.

[0013] Figure 4 shows in detail another preferred embodiment of gathering means 33 according to the inven-

tion. Slats 34 are connected by a ladder cord 35. Via drive rods 36 and 37 the transporting wheels 40, 41, 42 and 43 are moved via bevel gear wheels 38 and 39 whereby slats 34 are grouped at an angle to form a package on the upper part of the blind. A partially open guide 44 is here also provided for receiving the loops 45 of ladder cord 35.

[0014] Figures 5-7 show a number of embodiments of a ladder cord element according to the invention. These ladder cords are connected to a slat via their transverse elements.

[0015] Figure 5 shows a ladder cord 46 from a woven cord. A transverse connecting element (a rung) 47 is connected to a slat 48.

[0016] Figure 6 shows another ladder cord 49 with regular thickened portions (beads) 50.

[0017] Figure 7 shows a ladder cord 51. Apertures 52 are arranged at regular distances. This suspension means is applied in figure 3.

[0018] Figure 8 shows an embodiment of a housing of a venetian blind according to the present invention. This housing 53 may fulfill other additional functions, for instance as shown for hanging a main curtain 54 or a sunblind 55, or housing 53 may likewise be provided with lighting.

Claims

1. Venetian blind, comprising: a plurality of parallel and horizontally extending slats which are mutually connected by means of suspension means, and gathering means for gathering the slats together into a package, wherein the gathering means are adapted to form the package on the upper part of the venetian blind, **characterized by** a cleaning device for cleaning the slats, wherein the cleaning device is arranged on the upper part of the venetian blind below the position where the package of slats is formed.
2. Venetian blind as claimed in claim 1, **characterized in that** the cleaning device comprises a plurality of brushes.
3. Venetian blind as claimed in claim 1, **characterized in that** the cleaning device comprises a vacuum cleaner.
4. Venetian blind as claimed in any of the foregoing claims 1-3, **characterized in that** the suspension means are manufactured substantially from a flexible material and take the form of a ladder cord.
5. Venetian blind (1) including a plurality of parallel and horizontally extending slats (2, 22, 34, 48), suspension means (3) for mutually connecting the slats, the suspension means including a flexible ladder cord (4, 24, 35, 46, 49, 51), which includes a plurality of transverse rungs (47) between spaced parallel uprights (25), and gathering means (5, 28, 33) for gathering the slats together to form a package, wherein the gathering means (5, 28, 33) are adapted to form the package at a location remote from a bottom one of the plurality of slats and wherein the gathering means (5, 28, 33) include at least two rotatable transporting wheels (11, 13, 29, 30, 40, 42) which each drivingly engage an associated upright (25) of the flexible ladder cord.
6. Venetian blind of claim 5 wherein the flexible ladder cord (4, 24, 35, 46, 49, 51) is provided with discrete engagement formations (26, 47, 50, 52) at regular distances along at least one of its uprights (25).
7. Venetian blind of claim 6 wherein the discrete engagement formations include thickened portions (50), preferably in the form of beads.
8. Venetian blind of claim 6 wherein the discrete engagement formations include apertures (26, 52) formed in the upright (25).
9. Venetian blind of any one of claims 5-8 which further includes a confronting further wheel (10, 12, 41, 43) positioned adjacent to and associated with each of the at least two transporting wheels (11, 13, 40, 42) and mounted for rotation in a plane in which the associated one of the two transporting wheels is adapted to rotate, each of the uprights being engaged between one of the transporting wheels and the associated further wheel.
10. Venetian blind of claim 9 wherein each of the at least two transporting wheels (11, 13, 40, 42) is driven by a drive rod (14, 15, 36, 37).
11. Venetian blind of claim 10 wherein each drive rod (14, 15, 36, 37) drives a relevant one of the at least two transporting wheels by means of bevel gears (16-19, 38, 39).
12. Venetian blind of claim 8 wherein at least one of the two transporting wheels (29, 30) is a toothed wheel for engaging the apertures (26, 52) of the upright (25) engaged thereby.
13. Venetian blind of any one of claims 5-12 wherein the gathering means (5, 28, 33) further includes a partially open guide (31, 44) for guiding at least one of the uprights (25) while allowing the transverse rungs (47) to freely pass through.
14. Venetian blind according to any one of claims 5-13 which further includes a housing (7, 32, 53) for stowing the gathered package of slats.

15. Venetian blind of claim 14 wherein the housing (32, 53) is positioned at an angle with respect to a plane in which the blind generally extends.

16. Venetian blind of any one of claims 5-15 which further includes a cleaning device (6, 27) for dirt collection. 5

17. Venetian blind of claim 16 wherein the cleaning device is the cleaning device of any one of claims 1-4. 10

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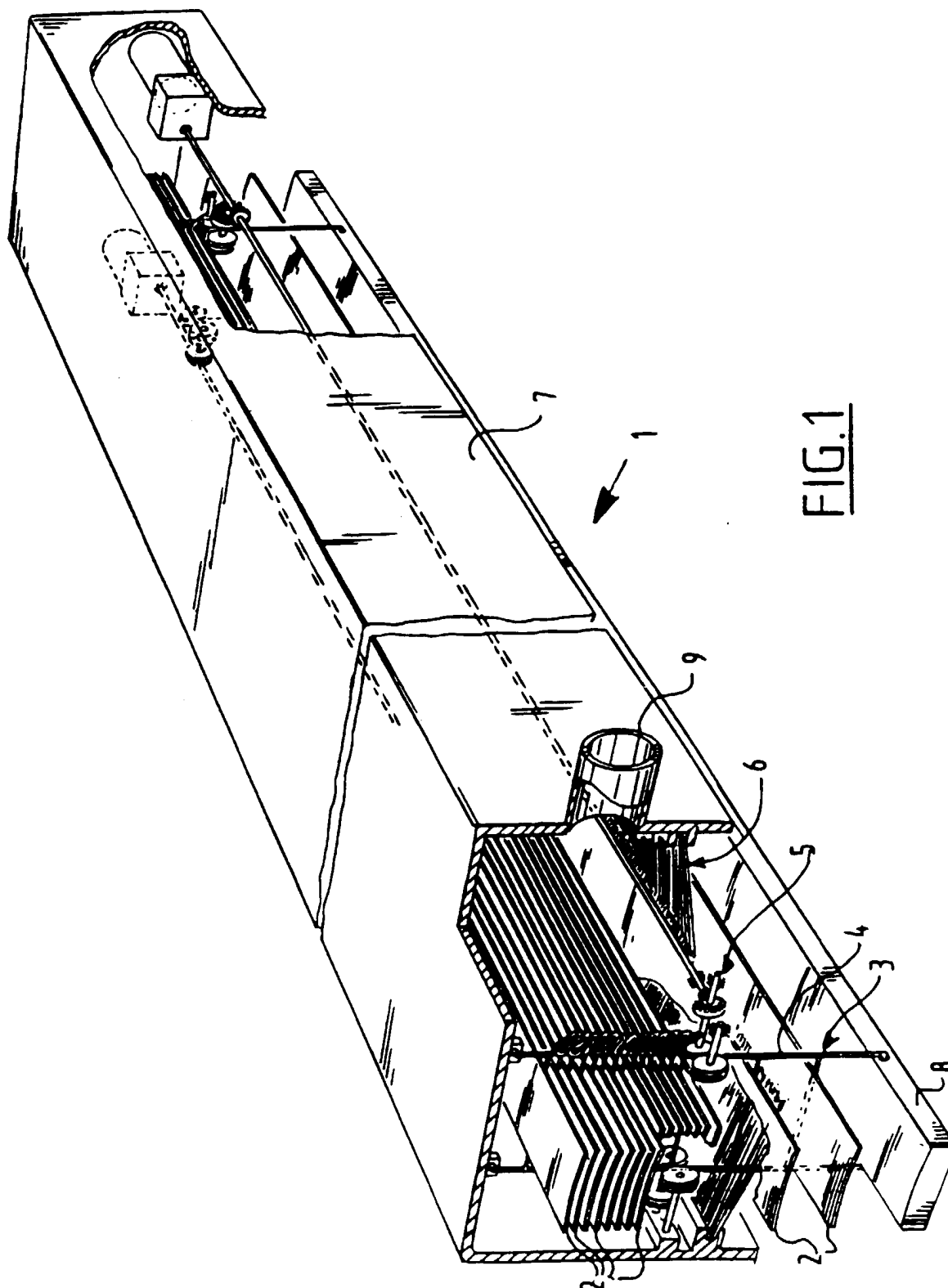
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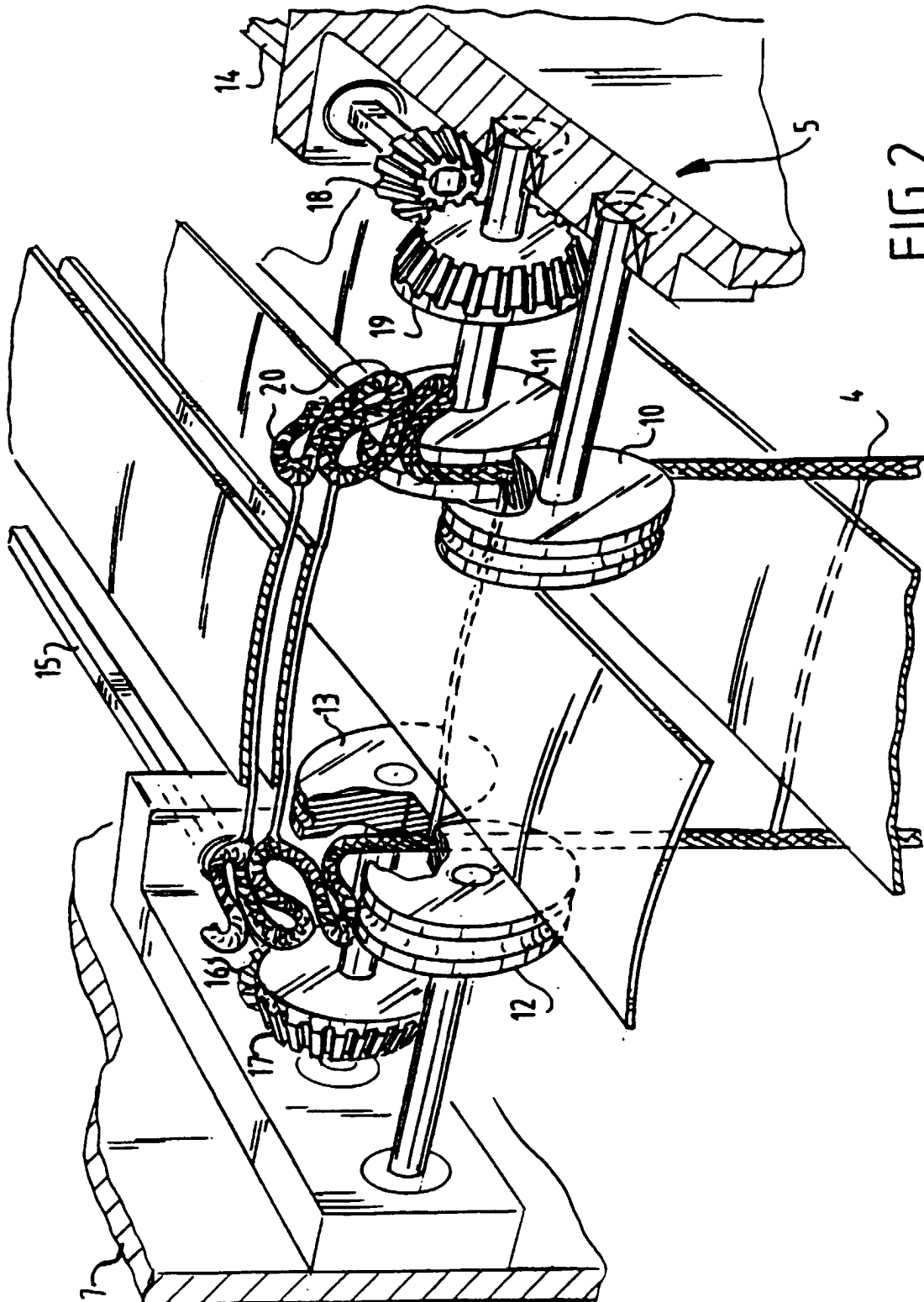


FIG. 2

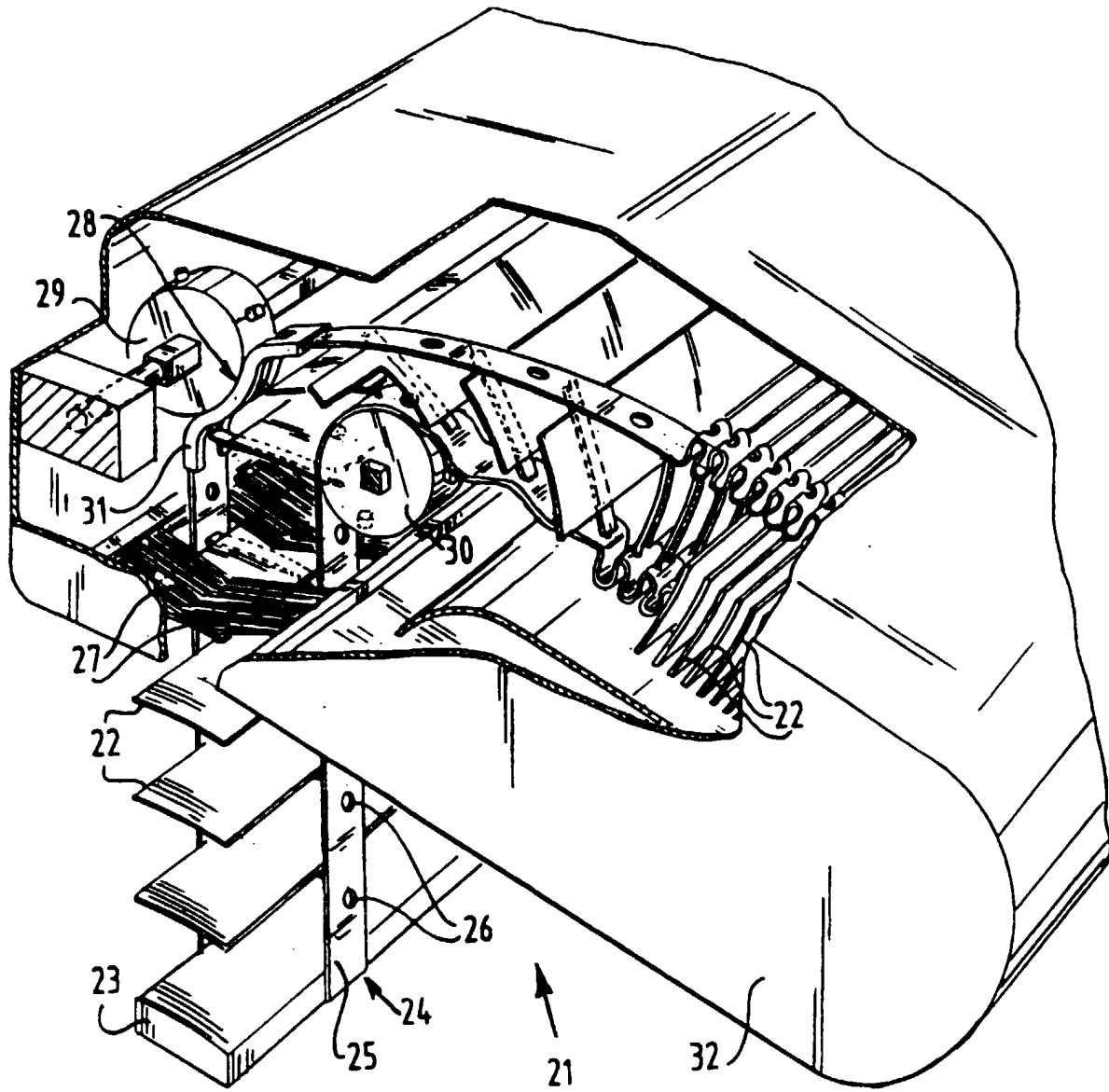


FIG.3

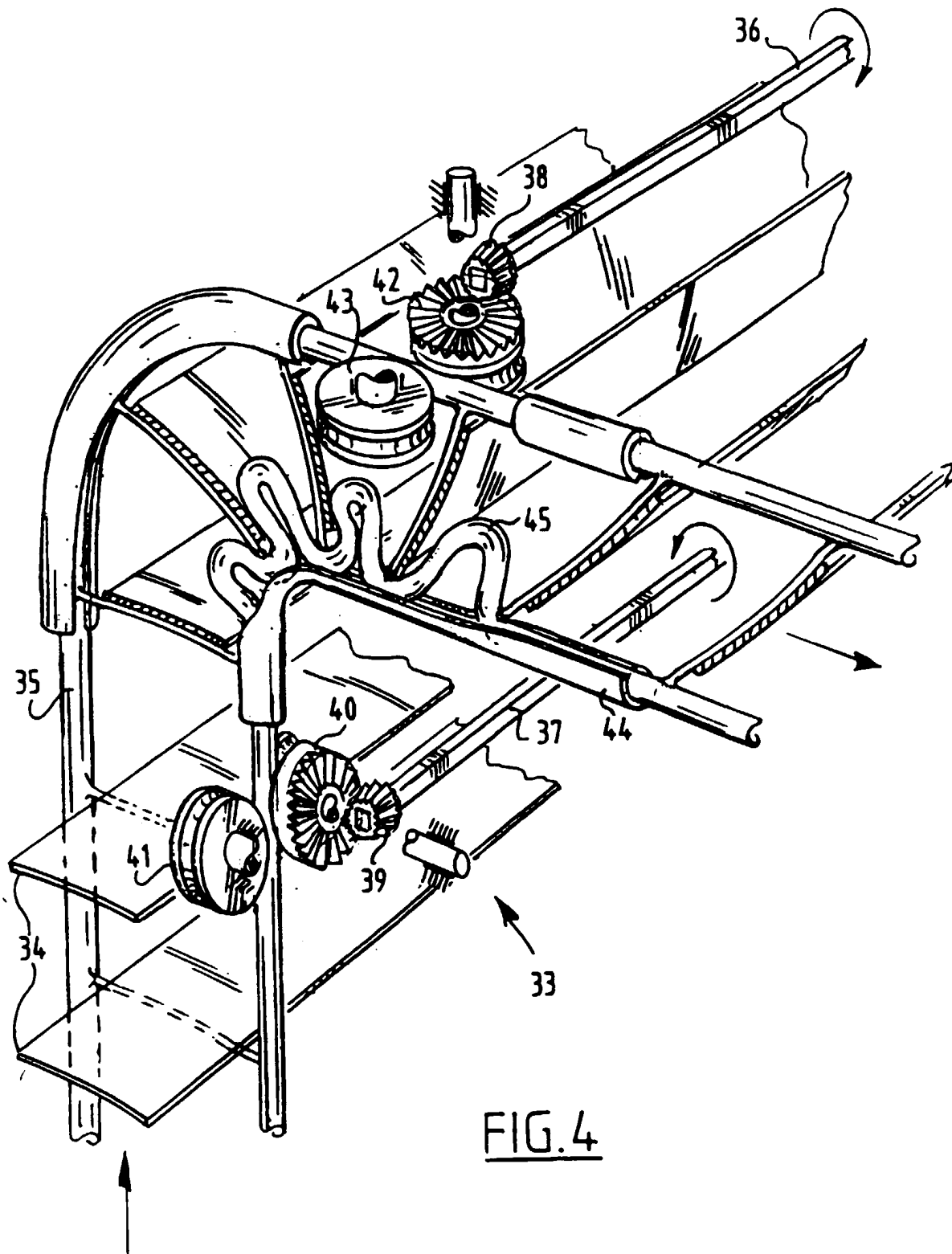


FIG.5

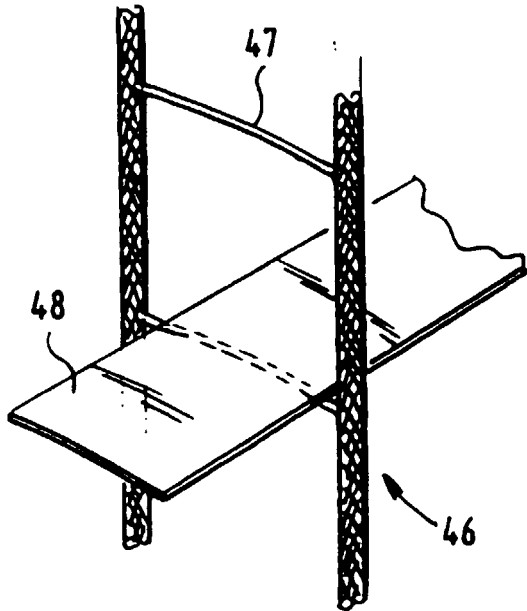


FIG.6

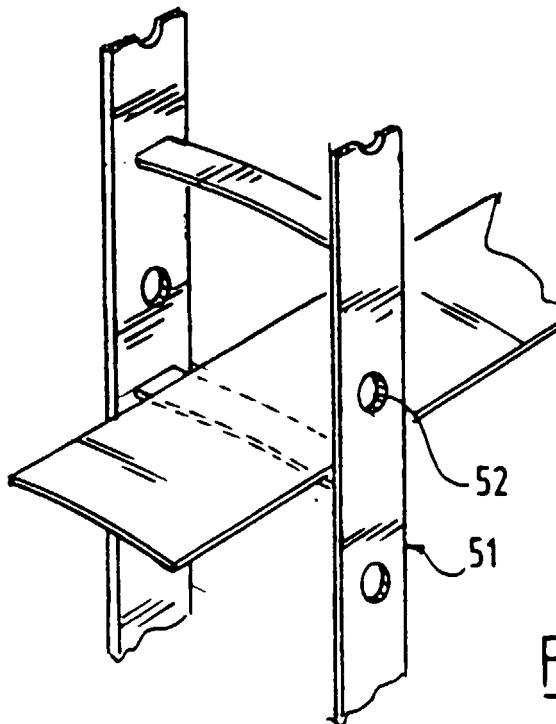
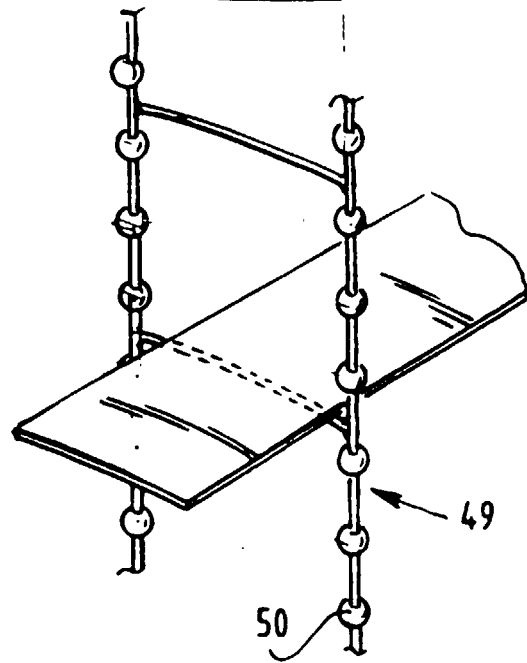


FIG.7

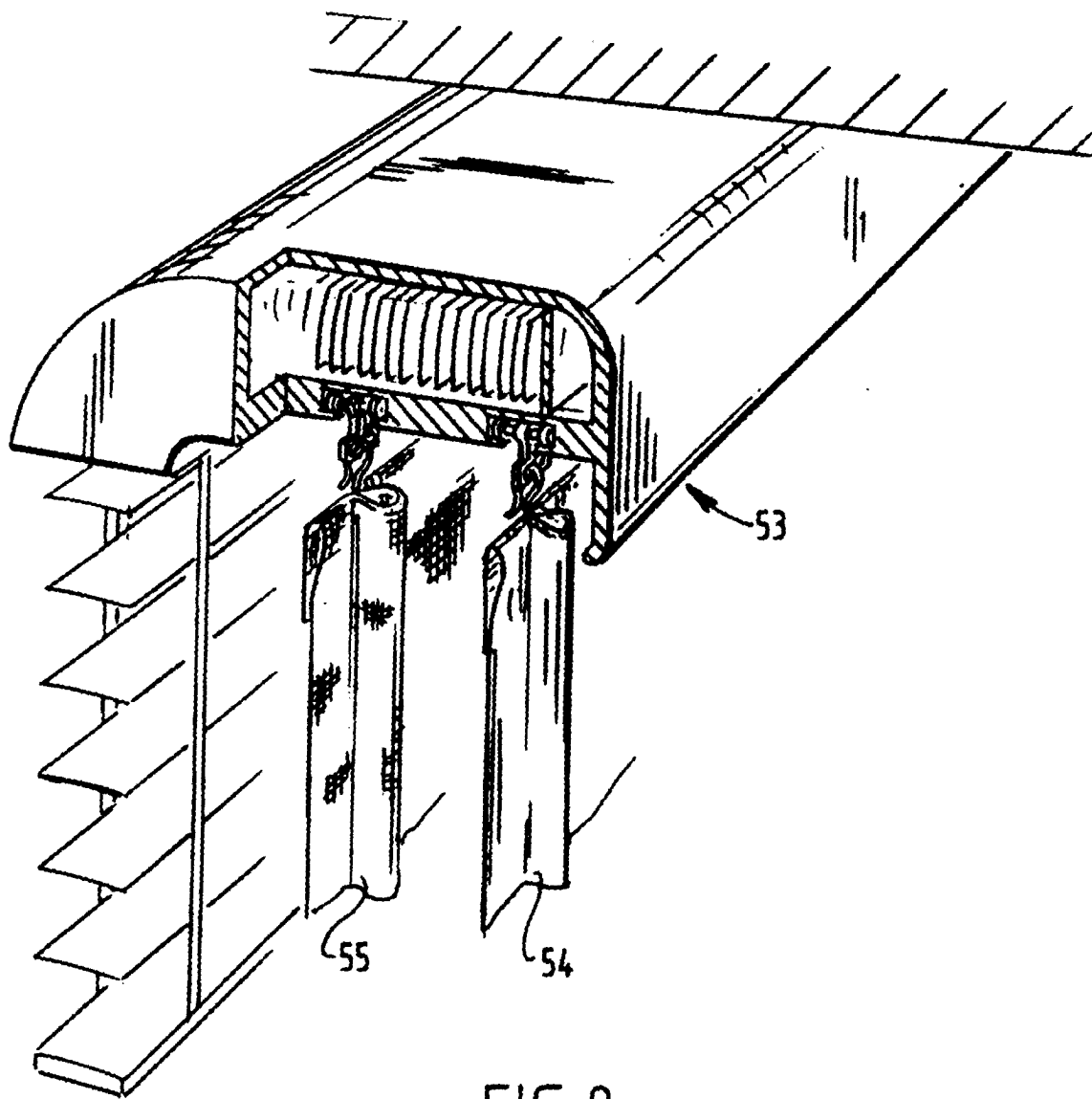


FIG. 8