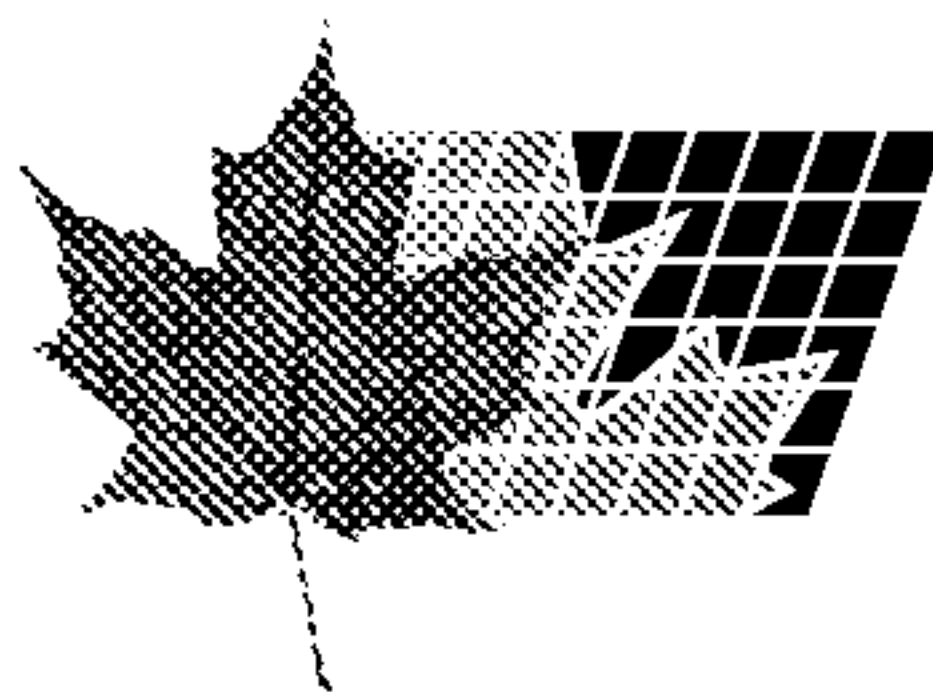




(72) FRASER, DONALD E., US

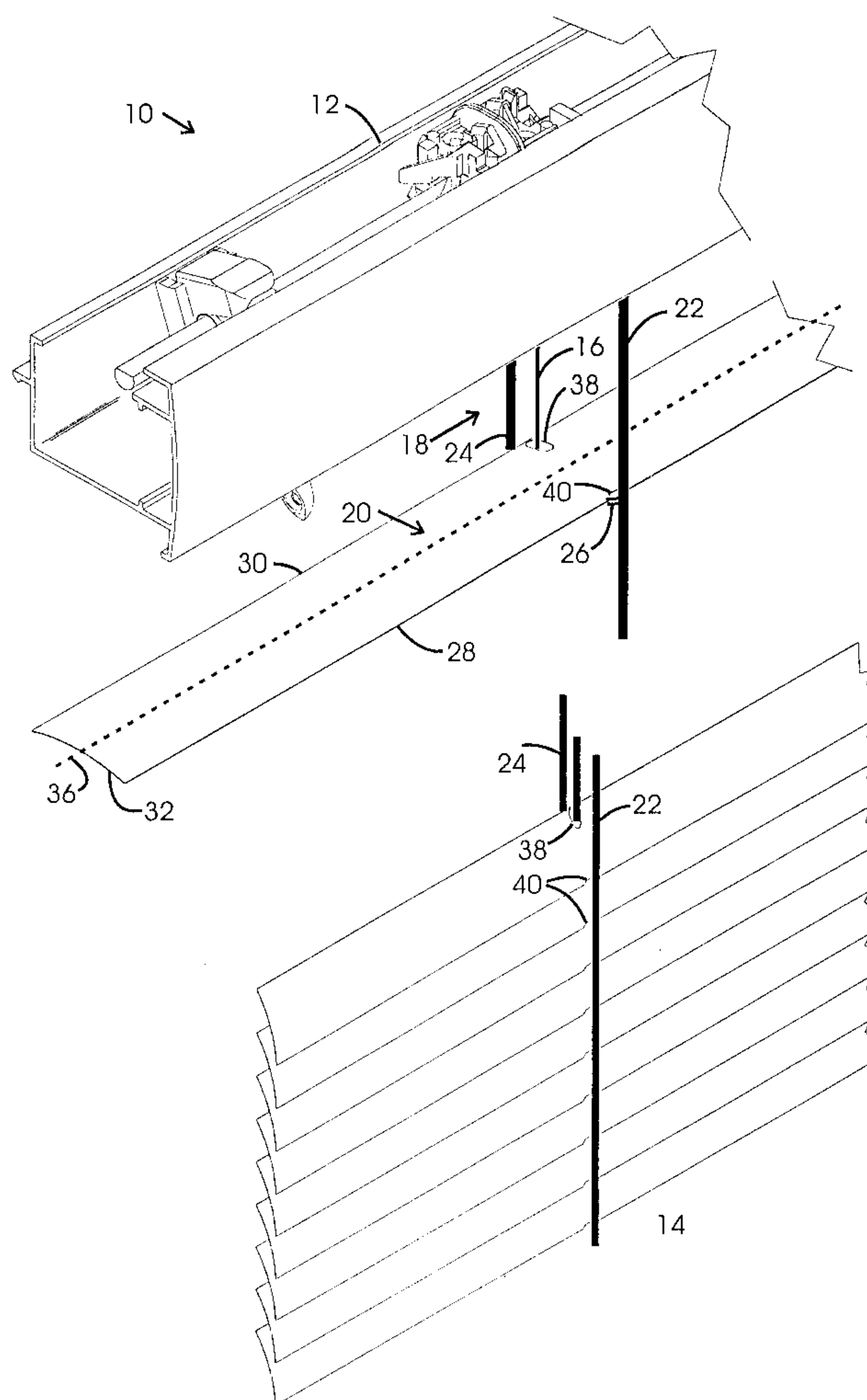
(71) HUNTER DOUGLAS INC., US

(51) Int.Cl.⁷ E06B 9/32

(30) 1999/06/02 (60/137,209) US

(54) **SYSTEME DE STORE VENETIEN LAISSANT FILTRER UN
MINIMUM DE LUMIERE**

(54) **VENETIAN BLIND SYSTEM WITH MINIMIZED LIGHT
LEAKAGE**



(57) A Venetian blind system includes horizontal slats with holes through the slats which receive lift cords. The slats overlap sufficiently to prevent light from passing through the holes when the blinds are closed in either the forward or rearward direction.

ABSTRACT

A Venetian blind system includes horizontal slats with holes through the slats which receive lift cords. The slats overlap sufficiently to prevent light from passing through the holes when the blinds are closed in either the forward or rearward direction.

5

VENETIAN BLIND SYSTEM WITH MINIMIZED LIGHT LEAKAGE

Background of the Invention

5 This application claims priority from U.S. Provisional Application S.N. 60/137,209, filed June 2, 1999, which is hereby incorporated by reference. Venetian blinds have been known for a very long time and include a plurality of vertically-spaced, horizontal slats. The blinds may be closed by tilting the slats forward or rearward so that they overlap. The amount of overlap is
10 usually minimized in order to use the smallest number of slats to cover the greatest area. The blinds are generally raised and lowered by lift cords, which pass through rout holes in the slats and are fastened to a bottom slat or rail. When the slats are tilted for closing, the rout holes generally allow light to pass through, at least when tilted in one direction, which is undesirable.
15 Some blinds have been made which use forward and rear lift cords, running outside the slats, with no rout holes, in order to overcome this problem. However, this makes the arrangement much more complicated, which is also undesirable.

20 Summary of the Invention

 The present invention provides a simple arrangement for Venetian blinds using rout holes in which, when the blinds are closed in both the forward and rearward directions, light leakage is minimized. In particular, the rout holes are covered in both closed positions, so there is not leakage
25 through the rout holes.

 In a preferred embodiment of the present invention, slots are provided in the front of the slats to ensure a tighter closing of the blinds.

 In a preferred embodiment of the present invention, the overlap between slats is greater than 30%.

30 In a preferred embodiment of the present invention, the rout holes are located in the rear of the slats.

Brief Description of the Drawings:

Figure 1 is an exploded perspective view, with the right side broken
5 away and the top portion enlarged, of a Venetian blind made in accordance
with the present invention;

Figure 1A is a perspective view of the full blind of Figure 1;

Figure 2 is a side view of the blind of Figure 1 closed in the rearward
direction;

10 Figure 3 is a front view of the blind in the position of Figure 2;

Figure 4 is a side view of the blind of Figure 1 closed in the forward
direction;

Figure 5 is a front view of the blind in the position of Figure 4;

Figure 6 is an enlarged section view taken through a rout hole and
15 notch of the blind of Figure 2; and

Figure 7 is an enlarged section view taken through a rout hole and
notch of the blind of Figure 4.

Description of the Preferred Embodiment:

20 The blind 10 of Figures 1-7, includes a head rail 12, a bottom rail 14, lift
cords 16, ladders 18, and slats 20. Each ladder 18 includes a front tilt cord
22, a rear tilt cord 24, and a plurality of ladder rung cords 26, extending from
the front tilt cord 22 to the rear tilt cord 24. The ladder rung cords 26 are
evenly spaced apart by a distance "D", and the slats 20 rest on the ladder
25 rung cords 26. The distance "D" between the ladder rung cords 26 defines
the pitch or spacing between slats.

Each slat 20 has a front edge 28, a rear edge 30, a left edge 32, and a
right edge 34. An imaginary center line 36 is shown in Figure 1, running
lengthwise from the left end 32 to the right end 34 of a slat. The width of the
30 slat 20 is the distance from the front edge 28 to the rear edge 30. Each slat
20 has rout holes 38, offset to the rear of the slat, and the lift cords 16 are

secured at the head rail 12 and bottom rail 14 and extend through the rout holes 38.

A preferred slat has a front-to-back width of 25 mm. In this slat, the rout holes 38 are about 0.75 mm from the rear edge of the slat and extend
5 forward a distance of 4.5 mm, so they terminate 5.25 mm from the rear edge, putting them in the rear 21% of the slat. It is preferred that the rout holes be located at least within the rear 25% of the slat, so that, for a 25 mm blind, the rout holes should not extend more than 6.25 mm from the rear edge. The left-to-right width of the rout holes 38 is 3 mm. The front edge 28 of each slat
10 20 also defines indentations or notches 40, having a front-to-back depth of approximately 1 mm and left-to-right width of approximately 2 mm, aligned with the rout holes 38.

In order to open and close the blind 10, the front and rear tilt cords 22, 24 are shifted relative to each other. For example, in Figures 1, 4, 5, and 7,
15 the rear tilt cord 24 is shifted upwardly relative to the front tilt cord 22. This causes the slats 20 to tilt forward, closing the blind 10 in a forward direction. In Figures 2, 3, and 6, the front tilt cord 22 is shifted upwardly relative to the rear tilt cord 24, closing the blind 10 in a rearward direction.

Looking now at Figure 7, when the blind 10 is closed in the forward
20 direction, the ladder rung cords 26 fit into the notches 40 of their respective slats 20, permitting the slats 20 to tilt more and thereby close more tightly than would be possible without the notches 40. Imaginary lines are shown, indicating the vertical position "R" occupied by the rout hole 38 of the lower slat 20, and it can be seen that the rout hole 38 of the lower slat 20 is covered
25 by the next higher slat 20, so there is no light leakage through the rout hole 38. Figure 5 shows a front view of the forwardly-closed blind 10. Only the top rout hole 38 can be seen in this view. The other rout holes 38 are shown in phantom. All the other rout holes 38 are covered by the next higher slat 20.

Looking now at Figure 6, when the blind 10 is closed in the rearward
30 direction, the front tilt cords 22 enter the notches 40, again permitting the slats 20 to tilt further and close more tightly than would be possible without the notches 40. Imaginary lines are shown, indicating the vertical position "R"

occupied by the rout hole 38 of the upper slat 20, and it can be seen that the rout hole 38 of the upper slat 20 is covered by the lower slat 20, so there is no light leakage through the rout hole 38. Thus, both in the forward and rearward closed positions, the rout holes 38 are covered by the next adjacent slat 20.

5 The overlap between slats is defined as the front-to-back width of the slat less the pitch or spacing "D" between slats, divided by the width of the slat. In the embodiment shown here, the width of the slat is 25mm, and the pitch "D" preferably is 12-17.5 mm. So, for the pitch of 17.5 mm, the overlap is $(25-17.5)/25$, or 0.30. For the pitch of 12, the overlap is $(25-12)/25$, or 0.52.
10 For the blind of the present invention, it is preferable that the overlap be at least 0.30 or 30%.

Each lift cord 16 preferably has a thickness of 1 mm or less (in this preferred embodiment the thickness is 0.9 mm), thereby permitting the rout holes 38 to be as small as possible while still permitting the slats to tilt and
15 move freely.

It will be obvious to those skilled in the art that modifications may be made to the embodiment described above without departing from the scope of the present invention.

What is claimed is:

1. A Venetian blind, comprising:
a plurality of vertically-spaced, horizontal slats, each of said slats
5 having a top surface and a bottom surface, a front edge and a rear edge, a
left end and a right end, and defining an imaginary centerline extending from
the left end to the right end, each of said slats also having at least two
spaced-apart rout holes extending from the top surface to the bottom surface
and located entirely within the rear 25% of the slat, each of said slats also
10 defining at least two recesses in its front edge;
at least two lift cords, extending through said rout holes; and
at least two ladders, each ladder including a forward tilt cord, a rear tilt
cord, and a plurality of ladder rung cords extending from said forward tilt cord
to said rear tilt cord, each of said ladder rung cords supporting one of said
15 slats, said forward tilt cords being aligned with said recesses in the front
edges of said slats.
2. A Venetian blind as recited in claim 1, wherein said recesses in
the front edge are aligned with the rout holes.
- 20 3. A Venetian blind as recited in claim 1, wherein there is an
overlap between the slats of at least 30%.
4. A Venetian blind as recited in claim 3, wherein the slats have a
25 width of approximately 25 millimeters, and there is a spacing between ladder
rung cords of 12 to 17.5 millimeters.
5. A Venetian blind as recited in claim 3, wherein said lift cords
have a diameter of 1 millimeter or less.

6. A Venetian blind as recited in claim 5, wherein the rout holes extend in a left-to-right direction 3 millimeters or less and in a front-to-back direction 4.5 millimeters or less.

5 7. A Venetian blind, comprising:

at least two ladders, each ladder including a forward tilt cord, a rear tilt cord, and a plurality of ladder rung cords extending from said forward tilt cord to said rear tilt cord, a plurality of horizontal slats supported on said ladder rung cords with a pitch spacing between the slats, each of said slats having a
10 length and a width, wherein the pitch spacing and the width of the slats defines an overlap, and wherein the overlap is greater than 30%.

8. A Venetian blind as recited in claim 7, wherein the width of the slats is approximately 25 millimeters, and the pitch is from 12 to 17.5
15 millimeters.

9. A Venetian blind as recited in claim 7, wherein said slats define rout holes, and further comprising lift cords extending through said rout holes.

20 10. A Venetian blind as recited in claim 9, wherein said rout holes are located entirely within the rear 25% of said slats.

11. A Venetian blind as recited in claim 9, wherein said lift cords have a diameter not exceeding 1 millimeter.

25 12. A Venetian blind as recited in claim 11, wherein said rout holes have a left-to-right dimension not exceeding three millimeters and a front-to-back dimension not exceeding 4.5 millimeters.

30 13. A Venetian blind system, comprising:

at least two ladders, each ladder including a forward tilt cord, a rear tilt cord, and a plurality of ladder rung cords extending from said forward tilt cord to said rear tilt cord;

a plurality of horizontal slats supported on said ladder rung
5 cords, each of said slats defining at least two rout holes for receiving lift cords;

at least two lift cords extending through said holes in said slats;
wherein upward movement of said rear tilt cords relative to said forward tilt
cords causes said slats to tilt to a forward closure position, and upward
movement of said forward tilt cords relative to said rear tilt cords causes said
10 slats to tilt to a rear closure position, and wherein, in both said forward and
rear closure positions, the slats overlap each other sufficiently to cover the
rout holes.

14. A Venetian blind system as recited in claim 13, wherein said
15 slats have an overlap of at least 30%.

15. A Venetian blind system as recited in claim 14, wherein said
slats have a width of approximately 25 millimeters, and there is a spacing
between ladder rung cords of 12 to 17.5 millimeters.

20

16. A Venetian blind system as recited in claim 13, wherein the
diameter of said lift cords does not exceed 1 millimeter.

17. A Venetian blind system as recited in claim 13, wherein the rout
25 holes have a width not exceeding 3 millimeters and a length not exceeding
4.5 millimeters.

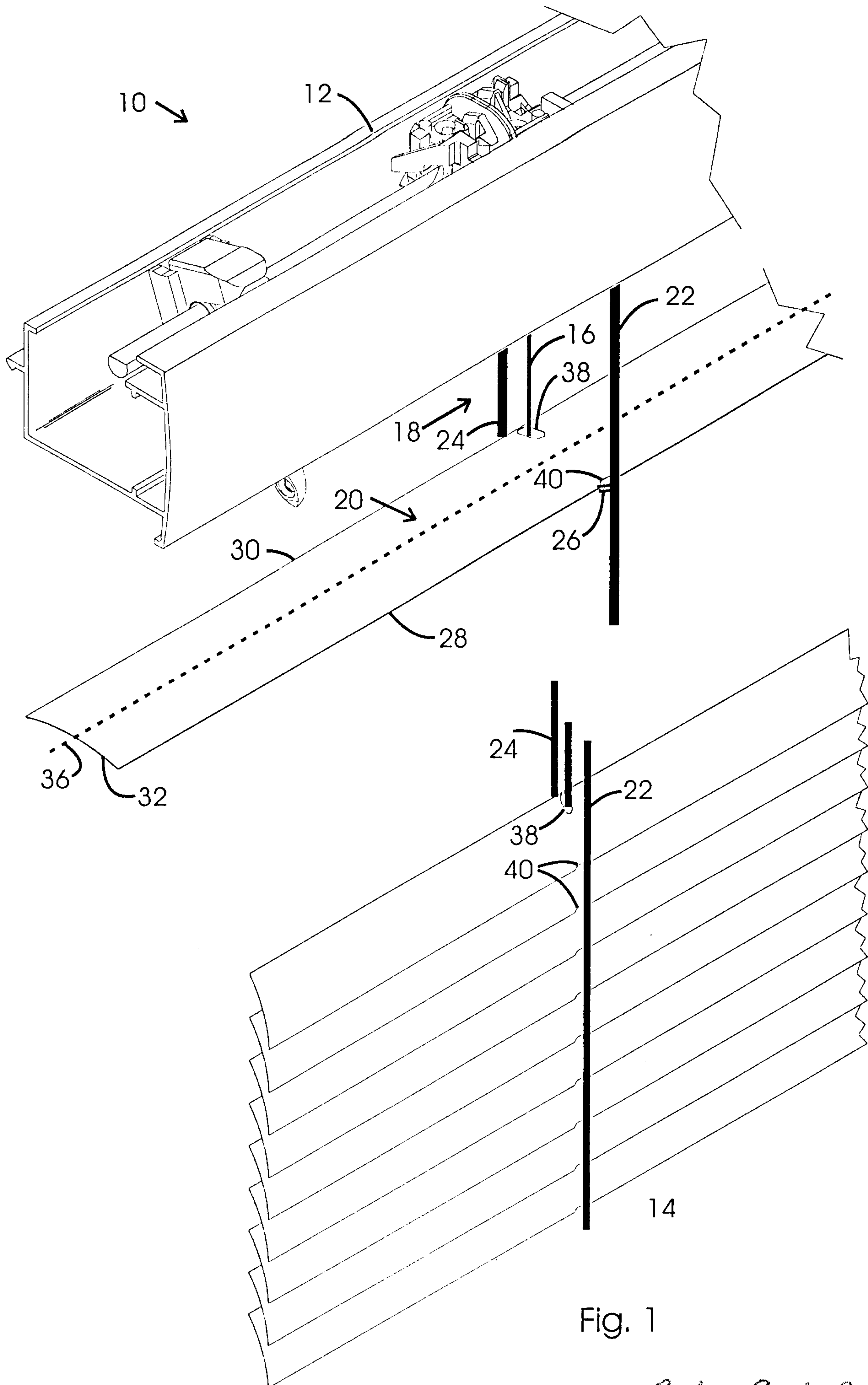


Fig. 1

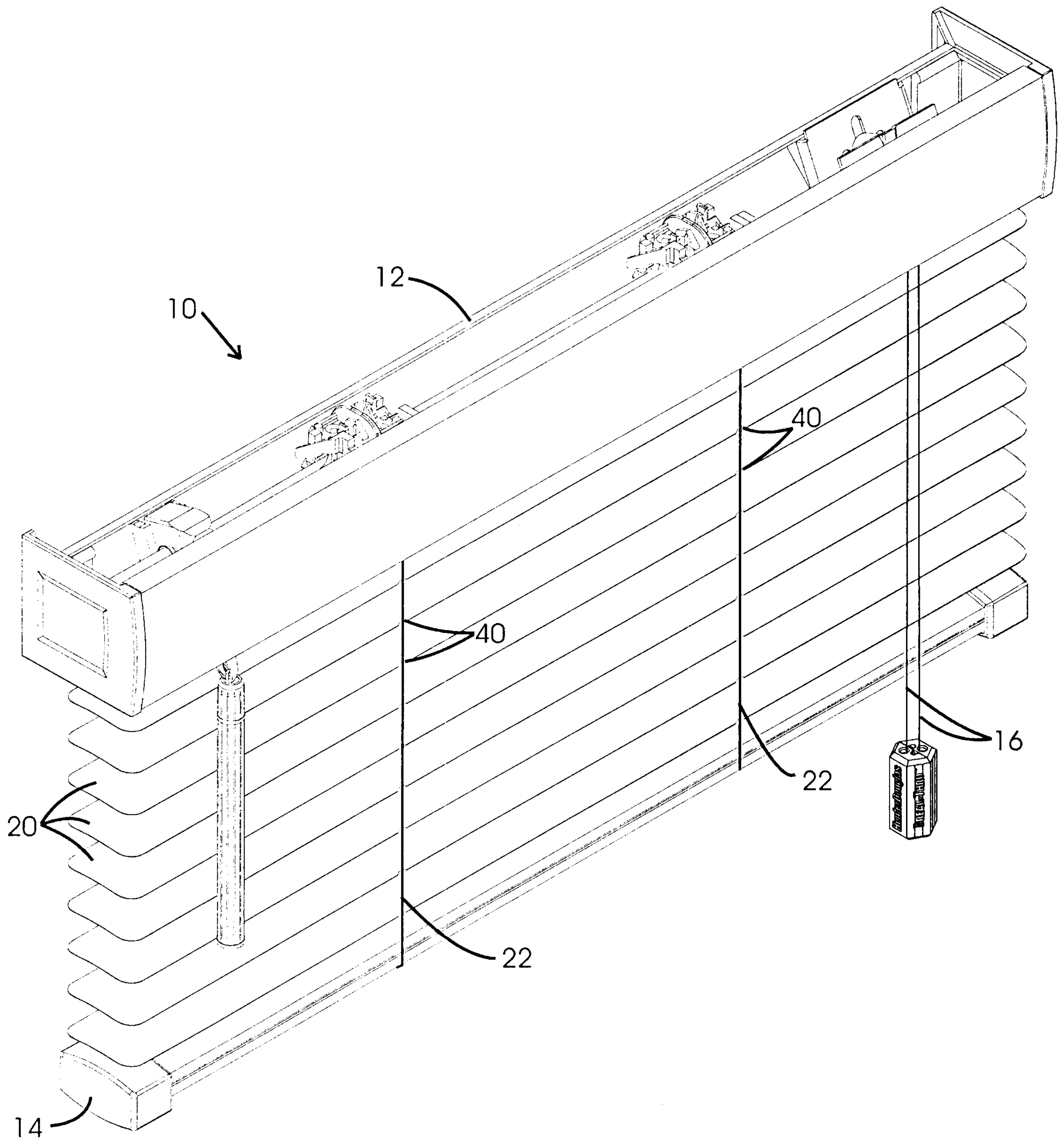


Fig. 1A

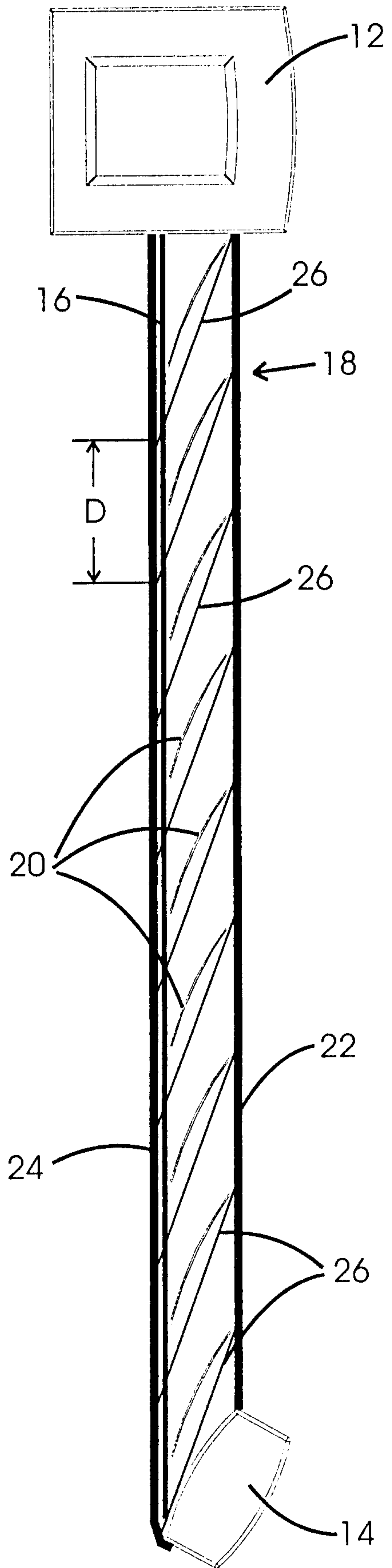


Fig. 2

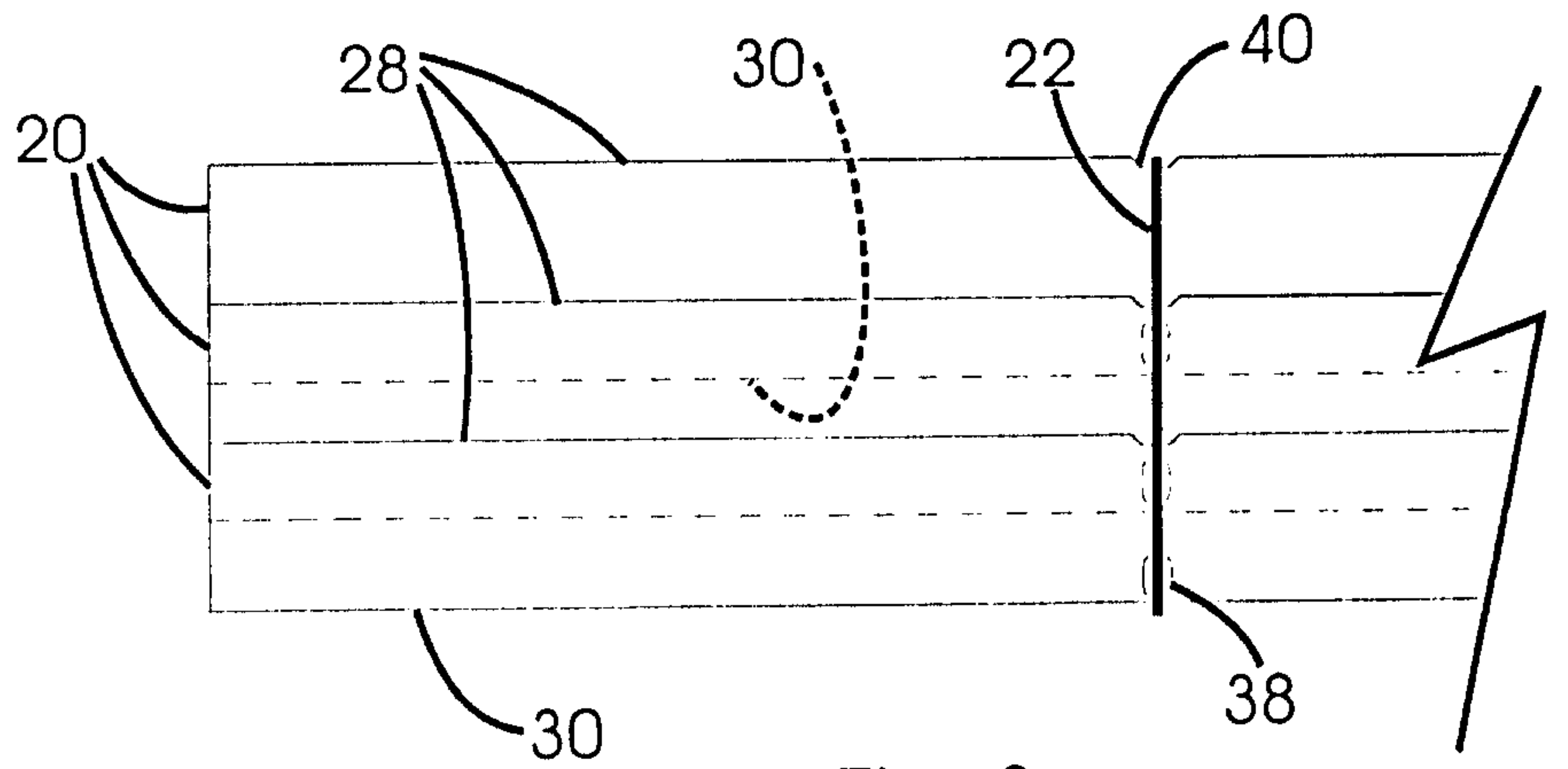


Fig. 3

