

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



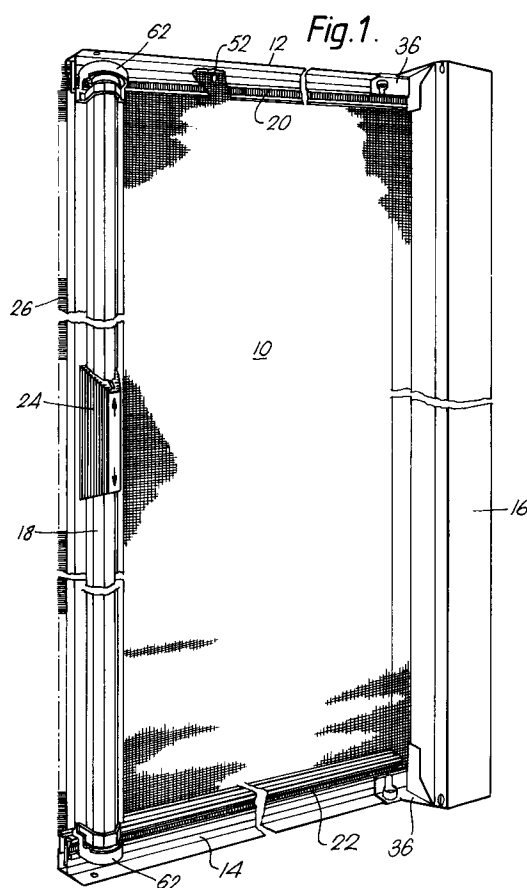
(11) Publication number:

0 489 450 A2

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **91202939.4**(51) Int. Cl.⁵: **E06B 9/08, E06B 9/58,
E06B 9/54**(22) Date of filing: **12.11.91**(30) Priority: **15.11.90 GB 9024853**(43) Date of publication of application:
10.06.92 Bulletin 92/24(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI NL SE(71) Applicant: **HUNTER DOUGLAS INDUSTRIES
B.V.
Piekstraat 2
NL-3071 EL Rotterdam(NL)**(72) Inventor: **Oskam, Herman
West Vlisterdijk 64A
NL-1744 AK Vlist(NL)
Inventor: Lontho, Roy Raymond
Doornenburg 100
NL-2261 XE Leidschendam(NL)**(74) Representative: **Jansen, Cornelis Marinus
Hunter Douglas Industries B.V.. Piekstraat 2
NL-3071 EL Rotterdam(NL)**(54) **A closure for a door or window opening.**

(57) A closure, such as an insect screen, for a door or window opening having guide tracks 12,14 at opposite sides, a retractor assembly 16 mounted at a third side of the frame, a flexible screen 10 wound at one of its ends to the retractor, a header bar 18 secured to the other end of the flexible screen, said header bar being guided by said guide tracks for movement perpendicular thereto. A pair of wheels, one mounted at each end of the header bar are operatively associated with one of the guide tracks and a brake and preferably also a drive mechanism are provided on the header bar, the brake being effective simultaneous to stop rotation of both of the wheels and thereby to arrest movement of the header bar at any location along the length of the guide tracks, and the drive means being arranged to urge the header bar to the closed position of the screen 10.

**EP 0 489 450 A2**

The present invention relates to a closure for a door or window opening. The invention is concerned principally, although not exclusively, with an insect screen form of such closure.

Conventionally, insect screens are mounted either to be lifted out bodily from the door or window, or, particularly in the case of doors, are mounted as hinged doors. As far as window insect screens are concerned, these are commonly made in a manner rather similar to roller blinds which can be retracted, e.g. by a spring loaded roller, or by a bead chain driven roller.

US-A-1887646 shows such a insect proof screen which is primarily for a window or may be used, according to Figure 11 and 12 of that patent, as a door screen.

It is an object of the present invention to provide improved and alternative structures to that disclosed in this document.

It is now proposed, according to the invention, to provide a closure for a door or window opening, said closure comprising a rectangular frame having a rigid guide track on each of two opposite sides, a retractor roller mounted at a third side of the frame, a flexible screen wound at one of its ends on said retractor roller, a header bar secured to the other end of the flexible screen, said header bar having opposite ends that are being engaged and guided by said guide tracks for movement perpendicular thereto, a pair of wheels, one mounted at each end of the header bar, each wheel being operatively associated with means for synchronising the movement of opposite ends of the header bar to maintain movement of said header bar perpendicular to the guide tracks and brake means on said header bar effective simultaneously to stop rotation of both of said wheels and thereby to arrest movement of the header bar at any location along the length of said guide tracks.

With such a structure it is possible to open the screen to any desired location and to lock the screen at that location along the length of the guide tracks. This can be advantageous particularly when it is used in combination with a sliding door arrangement which can be opened and adjusted for passage therethrough.

While the closure is primarily intended to act as an insect screen, such that the material of the flexible screen is of a mesh type, it is contemplated that the flexible screen could be imperforate and opaque to provide a shutter like closure.

The wheels may take various forms. For example, it could be simple wheels, e.g. with a rubber tyre on their periphery which runs on the guide track. An alternative possibility is having a wheel around which is wrapped a cord as disclosed, for example, in DE-A-3526745.

However, according to a preferred construction,

the wheels are each in the form of a toothed pinion and the guide tracks each have associated therewith a toothed rack, each rack being engaged by a separate one of said pinions. In order easily to mount the closure in a particular installation, the pinions are advantageously mounted in an adjustable bearings, permitting the teeth of the pinion to be disengaged from the teeth of the rack.

While it is contemplated that the wheels could be braked separately, advantageously they are connected to a common shaft and the brake means acts on the common shaft. With such a structure, the brake means may comprise a laterally displaceable brake shoe, engageable with said common shaft, or a sleeve attached thereto, a wedge shaped actuating member carried by said header bar adjacent said brake shoe and a handle manually displaceable axially of said header bar, connected to said actuating member to cause the actuating member to move therewith and thereby cause the brake shoe to be urged against the common shaft or sleeve.

It is contemplated that the wheels could each be connected to drive means adapted to rotate the wheels in a direction to move the header bar towards the closed position of the closure. Indeed, according to another aspect of the present invention, there is provided a closure for a door or window opening, said closure comprising a rectangular frame having a guide track on each of two opposite sides, a flexible screen attached at one of the ends at a third side of the frame and being retractable towards said third side, a header bar secured to the other end of the flexible screen, said header bar being guided by said guide tracks for movement perpendicular thereto, a pair of wheels one mounted at each end of the header bar, each wheel being operatively associated with one of said guide tracks, and drive means adapted to rotate the wheel in a direction to move said header bar towards a closed position of said closure.

The drive means may comprise at least one torsion spring mounted in said header bar, said torsion spring being operatively connected to said wheels. While the wheels could be separately driven, they are desirably connected to a common drive shaft and said at least one torsion spring acts on the common drive shaft.

The flexible screen may be attached at said one of its ends to a retractor roller, said retractor roller preferably includes at least one further torsion spring effective to cause the retractor roller to rotate to wind the screen in an opening direction into said retractor roller and said at least one torsion spring which is mounted on said header bar has a greater strength than that of said at least one further torsion spring on the retractor roller.

Where the wheels are each in the form of a

toothed pinion and the guide tracks each have associated therewith a toothed rack, each rack being engaged by a separate one of said pinions. Preferably as indicated above, the pinions are mounted on adjustable bearings, permitting the teeth of the pinions to disengage from the teeth of the rack, and further fixed teeth are provided and positioned to be engaged by the teeth of the pinions when they are disengaged from the teeth of the rack, to prevent rotation of the pinions. In this way the positioning of the teeth on the rack can be adjusted to suit a particular requirement despite the fact that there are drive means tending to rotate the pinions.

Preferably the retractor roller is mounted for rotation in bearings associated with each of said two opposite sides, and a stepped annular shell is associated with each end of the retractor bar, and a fixed abutment is carried by the guide track to cooperate with individual steps of the confronting shell carried by the retractor roller, a coil compression spring urges said shell towards the fixed abutment, the steps on the two shells are inter-engaged with the associated fixed abutment and provide an adjustment of the axial length of the roller to suit a particular door or window opening.

In order further to seal the door or window opening against the passage of insects, preferably the header bar has associated therewith an elongate brush projecting laterally away from the side of the header bar to which the screen is attached, this brush engaging the jamb of the door or window.

In order further to ensure that the insect screen is sealed with reference to the guide tracks, the screen preferably has associated with its opposite edges, guide edges engageable with the guide tracks.

In order that the present invention may more readily be understood, the following description is given, merely by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a perspective view of one embodiment of the closure of the invention shown mounted as an insect screen covering a door opening;

Figure 2 is a front elevation, partly in section, of the screen assembly shown in Figure 1;

Figure 3 is an enlarged fragmentary sectional view showing the mounting of the retractor roller;

Figure 4 is an enlarged fragmentary sectional view through the upper end part of the header bar as viewed in the direction of the retraction roller of the closure showing the pinion teeth engaged with the rack teeth;

Figure 5 is a similar view to Figure 4 but showing the pinion teeth engaged with further teeth

on the header bar;

Figure 6 is a detailed cross-sectional view through the header bar at the location of the brake operating handle;

Figure 7 is a view taken along the line VII-VII of Figure 6;

Figures 8 and 9 are schematic side elevations and cross-sections through the header bar illustrating the driving of the common shaft; and

Figure 10 is a section through the header bar perpendicular to that of Figure 9 illustrating the mounting of the lower end of the drive spring.

Referring first to Figure 1, the screen 10, shown as an insect screen, is mounted to close a door opening in the form of a rectangular frame having an upper and a lower guide track 12, 14 and a third side shown closed by a box 16. The left side of the screen 10 is secured to a vertical header bar 18 having upper and lower wheels (not shown in Figure 1) in the form of pinions which engage in racks 20, 22 carried on the upper and lower tracks 12, 14. The wheels are in fact carried by a common drive shaft and this can be braked by operation of a control handle 24 which is axially slidable on the header bar 18. The free side of the header bar 18 which is remote from the screen 10 is provided with a brush seal 26 to engage the jamb of the door opening when the screen is in the closed position.

Mounted within the box 16 is a retractor roller 28 (Figure 2) to which the other edge of the screen 10 is attached. In order to tension the screen 10 a retractor torsion spring 30 is mounted within the roller 28, in a conventional manner and surrounds an upper support shaft 32. A similar lower support shaft 32 is provided at the bottom.

At each end of the support shaft there is provided a bearing arrangement indicated by the general reference 34, and illustrated in more detail in Figure 3. Connected to the upper track 12 is a housing member 36, having a generally cylindrically shaped housing portion 38 in which is rotatably mounted a bearing member 40, having an upper stepped shell 42, provided with two ramp-like stepped surfaces 44, displaced 180° from one another. A fixed abutment 46 is provided on each of two diametrically opposite sides of the interior of the housing portion 38 and projects downwardly. The bearing member is urged axially upwardly by a coil compression spring 48 (shown in a compressed state) and is keyed to the shaft 32 for axial sliding movement relative thereto.

In use the housing member 36 is secured to the rail and in order to allow for the variation in the spacing between the upper and lower tracks to suit the minute details of a particular doorway, the rotational position of the shell 42 is chosen so that its appropriate steps 44 engage the abutments 46

to hold the shell firmly against any further rotation. It is contemplated that instead of having an abutment 46 a second similar shell 42 could be provided and in this instance it would be advantageous for the steps to be undercut so that they engage fully.

It will be seen that surrounding the lower part of the upper shaft 32 is a torsion spring engaging member 50, also shown in Figure 2, this engaging the end of the torsion spring 30. If reference is still made to Figure 2 it will be seen that a pin 52 is provided to the upper and lower ends of the screen 10 at one or more spaced intervals along the edges of the screen to act as guides for the screen on the tracks 12,14.

As mentioned earlier, the header bar 18 has at its upper and lower ends a wheel, and in the embodiment illustrated this wheel is in the form of a pinion 54 having peripheral teeth 56 (Figures 4 and 5). In Figure 4 the teeth are shown engaged with the teeth 58 of the upper rack 20. A similar assembly is, of course, provided at the bottom. The pinion 54 is mounted for rotation in an eccentric bearing 60 mounted in an upper cap part 62 of the header bar. The eccentric bearing 60 may be rotated so that the pinion 54 is moved out of engagement with the teeth 58 and into engagement with further teeth 64 on the cap 62 as shown in Figure 5. These further teeth 64 prevent the pinion 54 from rotating, while not engaged with the rack 20.

Associated with the cap 62 is a projection 66 which engages within the upper track 12 to guide the end of the header bar along the track. Because there are toothed pinions provided at each end, the guiding of the header bar is such as to ensure that the axis of the header bar 18 is always vertical, that is perpendicular to the direction of the tracks 12,14.

If reference is now made to Figures 6 and 7, it can be seen that the header bar 18 has a part tubular cross-section portion 68, and a recessed rear portion 70. Within the part tubular portion is mounted a common shaft 72 which carries the upper and lower wheels (pinions 54). This is a splined shaft on which is mounted a brake drum sleeve 74 which may optionally be engaged by a brake shoe 76 having a wedge like rear face 78. The operating handle 24 has a hollow body 79 which encompasses the part tubular portion 68 of the header bar and has a key portion 80 which extends through a rectangular aperture 82 in the header bar 18.

Mounted within the recess 70 is a rear operating member 84 which is located in the recess 70 and is engaged by the key 80 so that the front operating handle 24 and the rear operating member 84 can be caused to move longitudinally of the holding bar 18 together.

Facing the wedge like ramp 78 of the brake

shoe 76 is a complementary ramp surfaces 86. Thus, upon operation in an upward direction of the front operating member 24 (or the rear operating member 24) the two ramp surfaces 78,86 are more fully engaged thereby to urge the brake shoe 76 against the brake sleeve 74. As illustrated in Figure 7, this in fact urges the brake drum 74, and with it the common shaft 72, to the right. A displacement d is thus brought about and the resilience of the common shaft 72 is used to assist in this braking action.

If reference is made to Figures 8, 9 and 10, it can be seen that a portion of the common shaft 72 is surrounded by an upper drive housing 88, around which is disposed a torsion drive spring 90, the drive housing being engaged by the drive spring 90 through engagement in one of the splines 75 (Figure 6) therein, a retainer spring 92 holding the drive housing 88 in place. A projection 94 on a lower spring housing 96 engages in the opening 69 of the part tubular portion 68, to prevent the lower housing 96 from rotating to provide the reaction force for the spring 90. The spring 90 is wound in a direction to cause the common shaft 72 and therefore the pinions 54 to rotate in a direction to close the screen. The force produced by the drive spring 90 is greater than that produced by the recoil spring 30, which is simply used to take up slack in the screen when the header bar is moved towards the opening position. By operation of the handle 24, or the rear operating member 84, the screen can be locked anywhere along the length of the tracks 12,14. In this manner the header bar can simply be moved against the jamb of a sliding door which is in a partly opened position and the bar can be locked on its own. In this circumstance the screen could move in a track parallel to and adjacent the sliding door and the angled brush 26 is used to block the passage for insects.

Claims

1. A closure for a door or window opening, said closure comprising a rectangular frame having a rigid guide track on each of two opposite sides, a retractor roller mounted at a third side of the frame, a flexible screen wound at one of its ends on said retractor roller, a header bar secured to the other end of the flexible screen, said header bar having opposite ends that are being engaged and guided by said guide tracks for movement perpendicular thereto, a pair of wheels, one mounted at each end of the header bar, each wheel being operatively associated with means for synchronising the movement of opposite ends of the header bar to maintain movement of said header bar per-

pendicular to the guide tracks and brake means on said header bar effective simultaneously to stop rotation of both of said wheels and thereby to arrest movement of the header bar at any location along the length of said guide tracks.

2. A closure according to claim 1, wherein the wheels are each in the form of a toothed pinion and wherein the guide tracks each have associated therewith a toothed rack, each rack being engaged by a separate one of said pinions. 10
3. A closure according to claim 2, wherein the pinions are mounted on adjustable bearings, permitting the teeth of the pinions to be disengaged from the teeth of the rack. 15
4. A closure according to any preceding claim, wherein both of the wheels are connected to a common shaft and wherein said brake means acts on the common shaft. 20
5. A closure according to claim 4, wherein said brake means comprise a laterally displaceable brake shoe, engageable with said common shaft, or a sleeve attached thereto, a wedge shaped actuating member carried by said header bar adjacent said brake shoe and a handle manually displaceable axially of said header bar, connected to said actuating member to cause the actuating member to move therewith and thereby cause the brake shoe to be urged against the common shaft or sleeve. 25 30
6. A closure according to any preceding claim, wherein the wheels are each connected to drive means adapted to rotate the wheels in a direction to move said header bar towards the closed position of said closure. 35 40
7. A closure for a door or window opening, said closure comprising a rectangular frame having a guide track on each of two opposite sides, a flexible screen attached at one of the ends at a third side of the frame and being retractable towards said third side, a header bar secured to the other end of the flexible screen, said header bar being guided by said guide tracks for movement perpendicular thereto, a pair of wheels one mounted at each end of the header bar, each wheel being operatively associated with one of said guide tracks, and drive means adapted to rotate the wheels of said pair in a direction to move said header bar towards a closed position of said closure. 45 50 55
8. A closure according to claim 6 or 7, wherein

the drive means comprise at least one torsion spring mounted in said header bar, said torsion spring being operatively connected to said wheels.

9. A closure according to claim 8, wherein both of the wheels are connected to a common drive shaft and wherein said at least one torsion spring acts on the common shaft.
10. A closure according to claim 7, 8 or 9, wherein brake means are provided on said header bar effective simultaneously to stop rotation of both of said wheels and thereby to arrest movement of the header bar at any location along the length of said guide tracks.
11. A closure according to claim 8, 9 or 10, wherein the flexible screen is attached at said one of its ends to a retractor roller, and wherein said retractor roller includes at least one further torsion spring effective to cause said retractor roller to rotate to wind the screen in an opening direction onto said retractor roller, and wherein said at least one torsion spring mounted on said header bar has, a greater strength than that of said at least one further torsion spring on the retractor roller.
12. A closure according to any one of claims 6 to 11, wherein the wheels are each in the form of a toothed pinion and wherein the guide tracks each have associated therewith a toothed rack, each rack being engaged by a separate one of said pinions, on adjustable bearings permitting the teeth of the pinions to be disengaged from the teeth of the rack and wherein further fixed teeth are provided and positioned to be engaged by the teeth of the pinions, when they are disengaged from the teeth of the rack, to prevent rotation of the pinions.
13. A closure according to any preceding claim, wherein the retractor roller is mounted for rotation in bearings associated with each of said two opposite sides, and wherein a stepped annular shell is associated with each end of the retractor bar, and a fixed abutment is carried by the guide track to cooperate with individual steps of the confronting shell carried by the retractor roller, a compression spring urges said shell towards the fixed abutment, the steps on the two shells are inter-engaged with the associated fixed abutment and provide an adjustment of the axial length of the roller to suit a particular door or window opening.
14. A closure according to any preceding claim,

wherein the header bar has associated therewith an elongate brush projecting laterally away from the side of the header bar to which the screen is attached.

5

15. A closure according to any preceding claim, wherein the screen has associated with its opposite edges guide elements engageable in the guide tracks.

10

16. A closure according to any preceding claim, wherein the screen is in the form of an insect screen.

17. An insect screen for a door or window opening, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

15

20

25

30

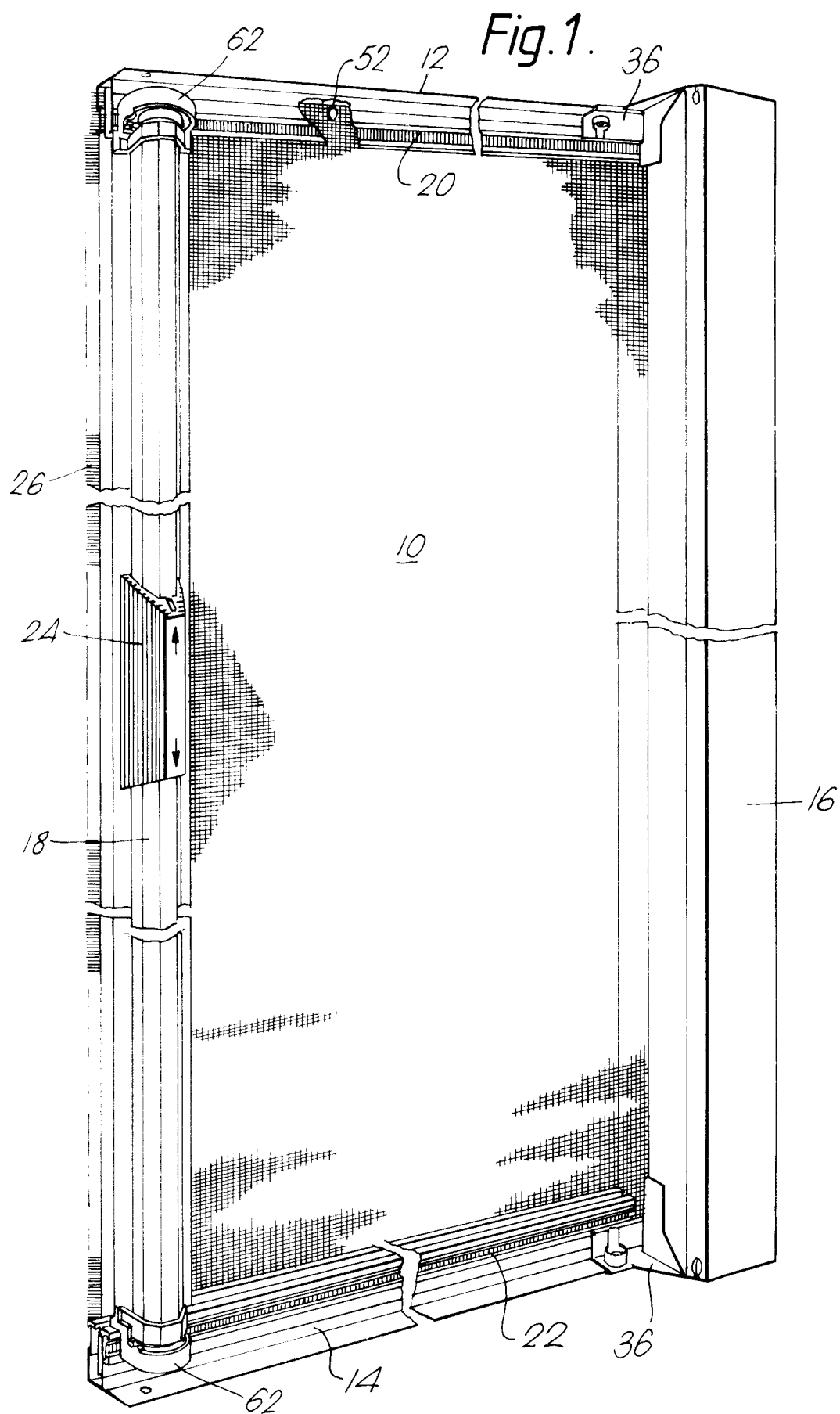
35

40

45

50

55



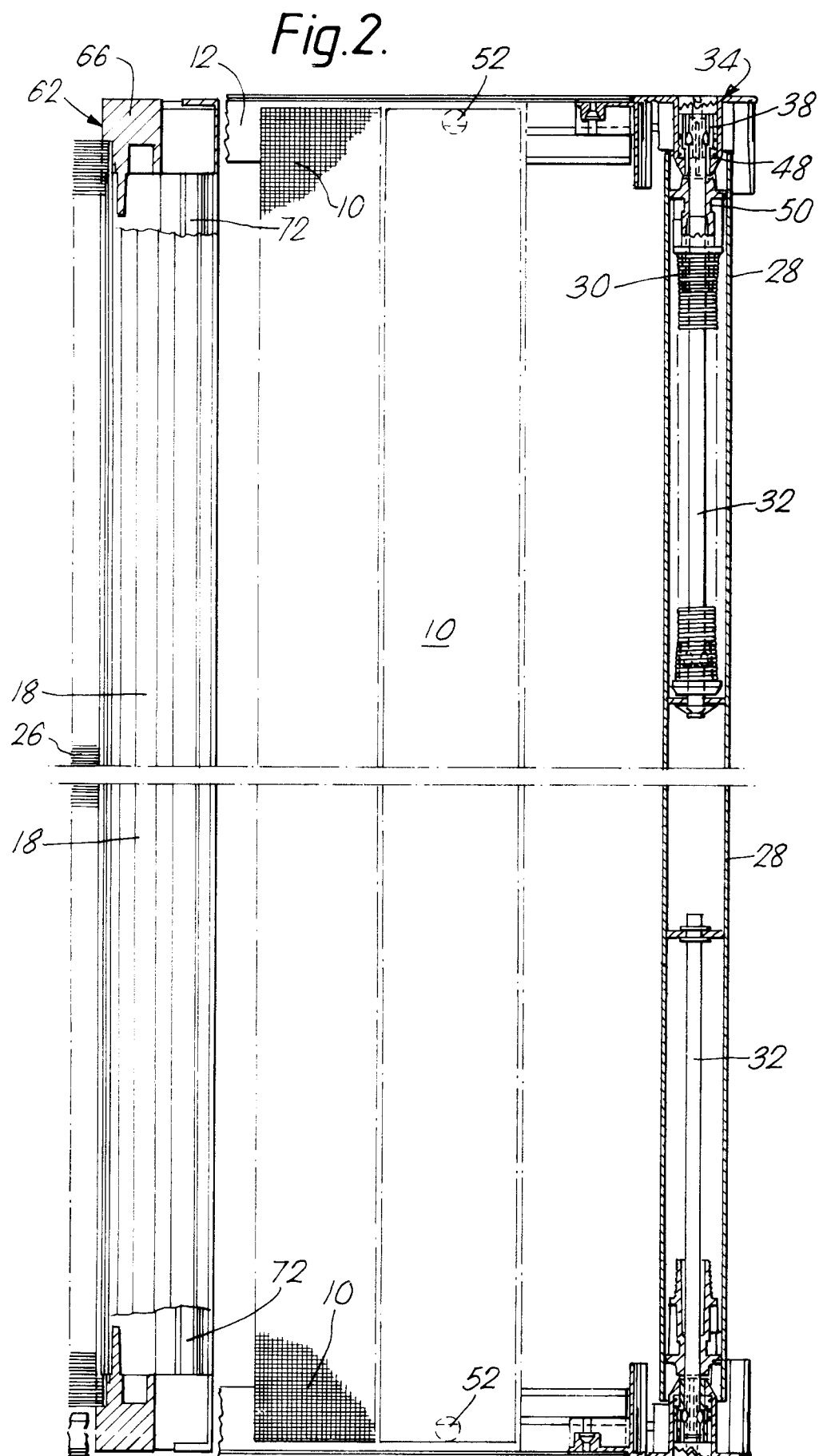


Fig. 3.

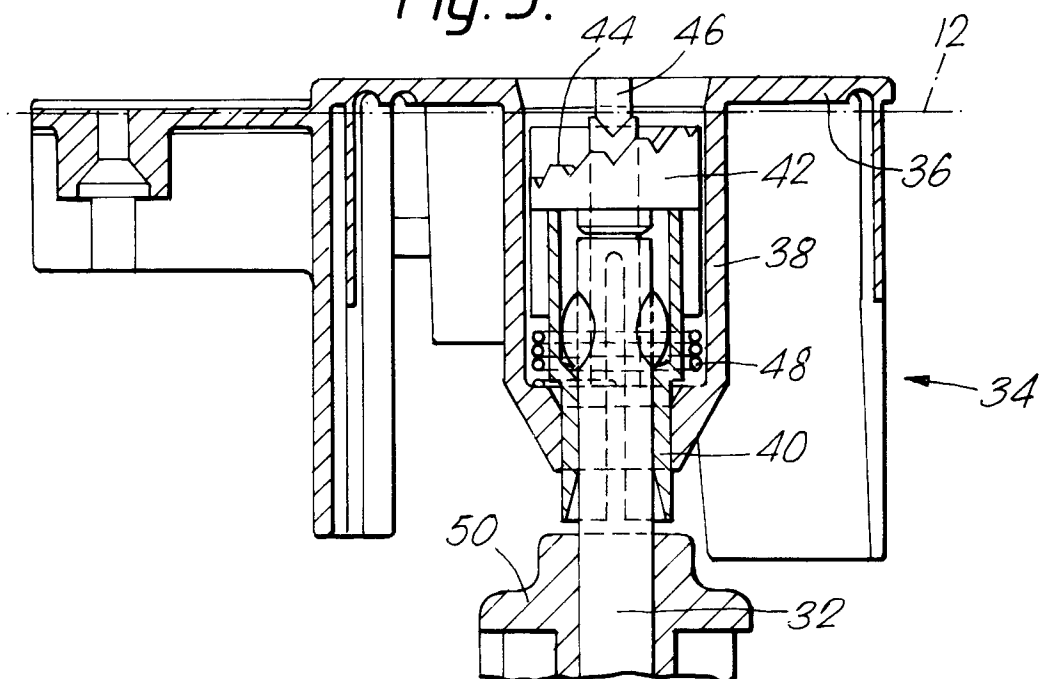


Fig. 4.

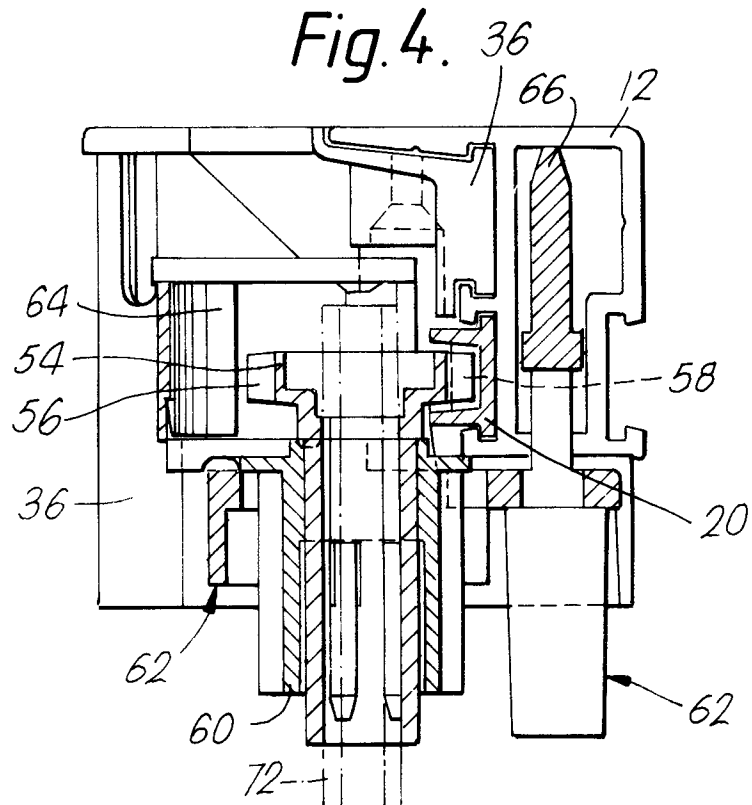


Fig. 5.

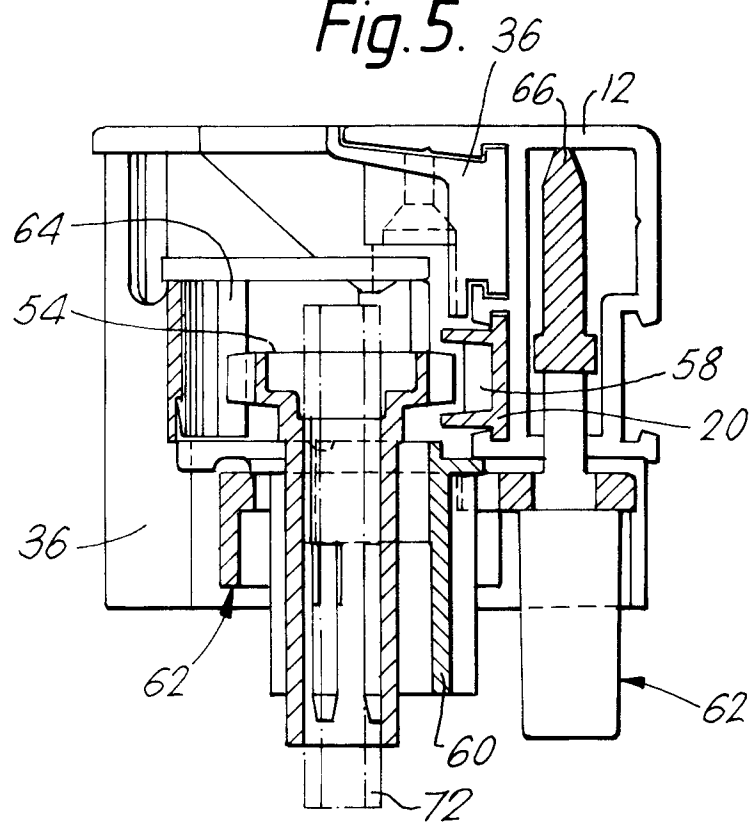


Fig. 6.

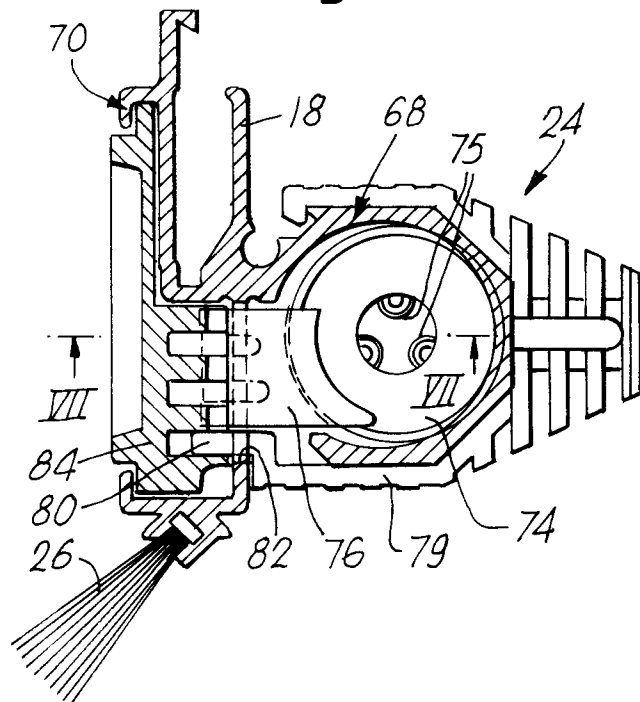


Fig.7.

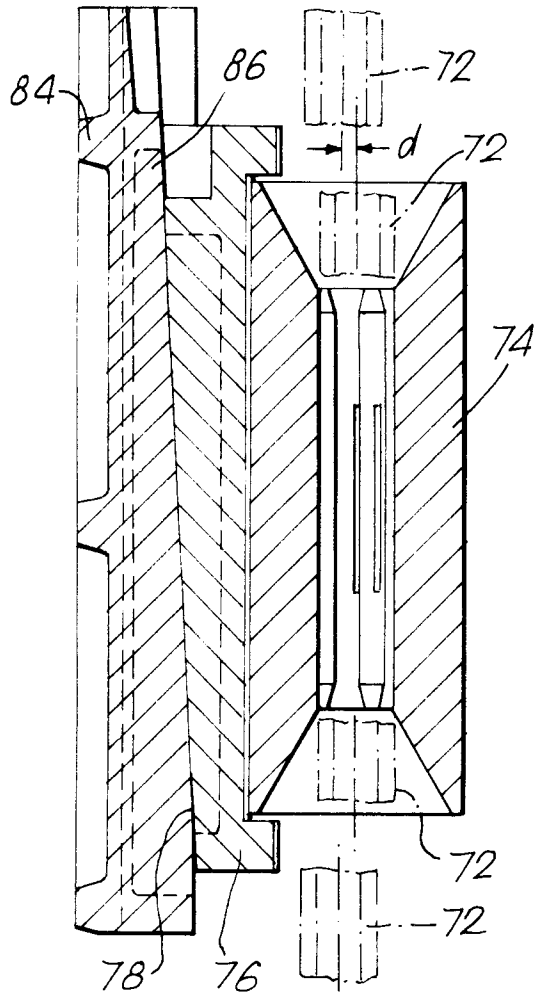


Fig.8.

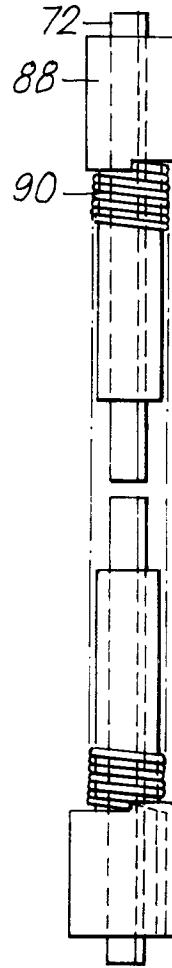


Fig.9.

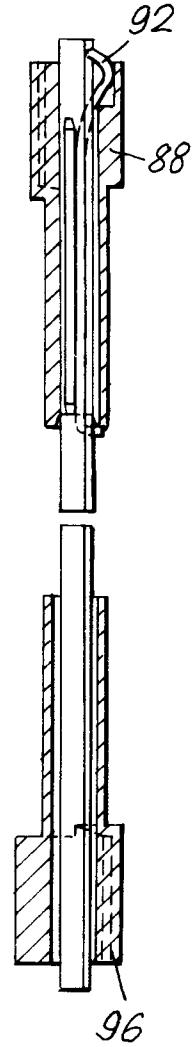


Fig.10.

