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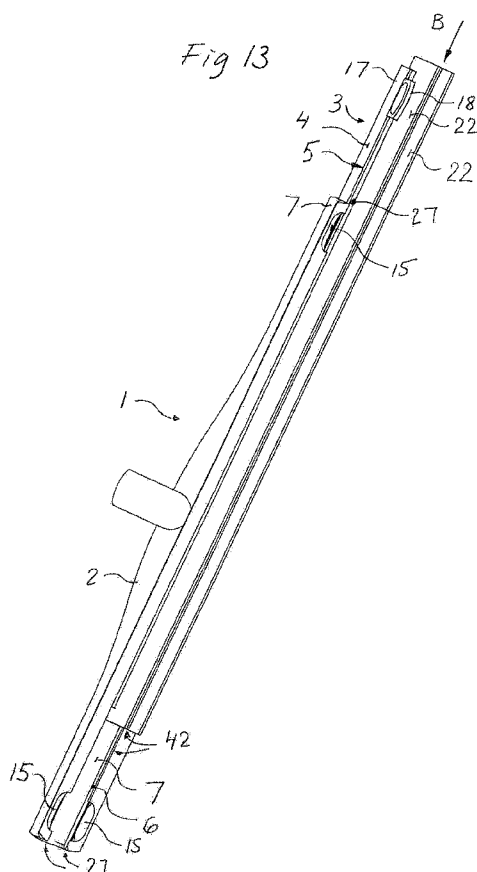
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(54) Title: CLEANING TOOL



(57) Abstract: Coupling for the releasable interconnection of a cleaning tool and a cleaning instrument, the cleaning tool having a rectangular head, said head having an upper coupling element and the cleaning instrument having a lower coupling element, said coupling elements having a locating arrangement via which the coupling elements, when interconnected, are shape-dependently locked in several first directions in relation to each other, one of the coupling elements having one locking surface and the other of the coupling elements having a second locking surface, the normals (perpendiculars) of said locking surfaces being aligned in a second direction that deviates considerably from the previously mentioned first directions, these locking surfaces, in the interconnected state, being engaged with each other, the locking surfaces being moved, on the application of pressure to an operating member, to a position relative to each other and in which they are released from each other, it then being possible to pull the upper coupling element apart from the lower coupling element.



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CLEANING TOOL

Technical area

The present invention is based on a coupling for the releasable interconnection of
5 a cleaning tool and a cleaning instrument, the cleaning tool having a rectangular
head, said head having an upper coupling element and the cleaning instrument
having a lower coupling element, said coupling elements having a locating
arrangement via which the coupling elements, when interconnected, are shape-
dependently locked in several first directions in relation to each other.

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Technical background

The use of a rectangular-headed cleaning tool with a cleaning instrument attached
to one of the long sides of the head has long been known in the internal and
external cleaning of, for example, buildings and vehicles. Usually, the head is
15 attached, at a fixed or at an adjustable angle, to a shaft on one of the long sides of
the head. The cleaning instrument can, for example, be a brush, a mop, a sponge
or a scraper (squeegee). With a cleaning tool as described above, large surfaces
can be cleaned in a relatively efficient way. Various types of brushes or mops are
most often used when removing dry dirt particles from the surface that is to be
20 cleaned. Where the surface to be cleaned is damp, it is often appropriate to use a
scraper as the cleaning instrument. In this connection, it is possible to displace a
mixture of liquid and solid particles so that said mixture can be further transported
to, for example, a drain. The scraper can include a rubber or rubber-like blade
made of a porous or solid material. The imposed requirement is, clearly enough,
25 cleaning that is as effective as possible with as little work effort as possible. If the
surface to be cleaned is entirely flat and the blade is completely straight, perfect
cleaning of said surface is, in principle, achievable. In reality, it is of course the
case that the surface to be cleaned has unevennesses and that the blade deviates
from the desired shape. The result is that the scraper leaves behind liquid and dirt
30 particles, this necessitating further scraping of the same surface. A scraper used in
this way is in constant contact with dirt and thus needs frequent cleaning.
Consequently, there is a requirement that the scraper should be so designed that
it is easy to clean. Used in, for example, the foodstuffs industry, the hygiene

requirements are particularly high. The tools used there must not have spaces that can act as dirt pockets in which colonies of bacteria can develop. There is also a requirement that it should be possible to autoclave the cleaning tools. A solution to this problem is indicated in DK175909. There, a rubber-like blade is moulded as an integral element of a rigid head, these together forming a scraper with no dirt pockets. However, a device based on that invention has the same efficiency limitations as other known scrapers of a similar basic design. Another disadvantage of that and many other known cleaning instruments is that they are not so easy to replace when they become worn. In many cases, the instructions are that the whole tool must be replaced. As it is only the cleaning instrument that is subject to great wear, this is unnecessarily costly. A scraper, for example, is used in intensive physical contact with surfaces that are to be cleaned, this leading to wear of the scraper's blade. With the purpose of facilitating the replacement of the wear part, DK9200097U3 presents a solution that involves the cleaning instrument including a lower coupling element with longitudinal shoulders that can be pushed into corresponding grooves in an upper coupling element on the head. These shoulders and grooves together constitute a locating arrangement via which the coupling elements, when interconnected, are shape-dependently locked upwards-downwards and forwards-backwards, i.e. in several first directions relative to each other. The disadvantage of this solution is that the coupling elements are locked to each other in a second direction (longitudinally, right-left) by a friction-dependent locking in the form of an interference fit. When using a scraper, it is often necessary to move the scraper laterally in relation to the surface to be cleaned without lifting the scraper from said surface. Relative to the head, this gives rise to longitudinal forces on the scraper. In said second direction, these forces place great demands on the locking. Friction-dependent locking requires a permanent engagement of relatively large forces. This is difficult to achieve with the thermoplastic materials here in question. As an alternative to an interference fit, the same source proposes the use of screws or other already known mounting elements. A more developed and also more costly variant of friction-dependent locking is proposed by, for example, US477694. There, the coupling elements are made of metal and the locking force can be adjusted via a screw. This device has the disadvantage that it requires an operating member to be actuated at both

interconnection and disconnection. The same disadvantage is also exhibited by US4941228. There, a pin in the upper coupling element is pressed down into a relatively soft rubber blade. No known technology indicates a solution for interconnecting the coupling elements in an easily releasable, yet also safe, way. It is desirable that interconnection should be possible without any actuation of an operating member and that the cleaning instrument should be securely attached, in all directions, to the cleaning tool. It is also desirable that releasing should be possible in such a way that the actuation of the operating member is effected using the same grip that separates the cleaning instrument from the cleaning tool. Such a safe but easily releasable coupling makes it possible for a single cleaning tool to be used for various types of cleaning instruments. This is an advantage.

Explanation of the invention

The main purpose of the present invention is that it should result in a device as set out in the ingress, said device giving easily releasable yet, at the same time, safe interconnection between a cleaning tool and a cleaning instrument.

Another purpose of the invention is that it should result in a device that enables interconnection without the actuation of an operating member.

A further purpose of the invention is that it should result in a device that, using the same grip that separates the cleaning instrument from the cleaning tool, enables release through an actuation of an operating member.

Yet another purpose of the invention is that it should result in a cleaning instrument in the form of a scraping tool that enables the very efficient cleaning of a surface that is to be cleaned.

Still another purpose of the invention is that it should result in a scraper that is easy to keep clean.

These purposes are achieved in a device as set out in the ingress where one of the coupling elements has one locking surface and the other of the coupling

elements has a second locking surface, the normals (perpendiculars) of said locking surfaces being aligned in a second direction that deviates essentially from the previously mentioned first directions, these locking surfaces, in the interconnected state, being engaged with each other, the locking surfaces being moved, on the application of pressure to an operating member, to a position relative to each other and in which they are released from each other, it then being possible to pull the upper coupling element apart from the lower coupling element, it being further the case that the cleaning instrument is a scraper that has, at a distance from each other, two or more blades of a rubber-like material, said blades being moulded as an integral element of a part that has a lower coupling element.

The invention will now be described with reference being made to the figures set out below. These figures are intended to explain the invention and not to limit it.

Fig.1 is an end view of a cleaning tool.

Fig. 2 shows the cleaning tool in fig. 1 in perspective, obliquely from below.

Fig. 3 is a partial enlargement of the ringed detail in fig. 2.

Fig. 4 shows the cleaning tool in figures 1 – 3 in perspective, obliquely from above.

Fig. 5 shows a coupling element for a cleaning instrument in perspective, obliquely from above.

Fig. 6 shows the coupling element in fig. 5 obliquely from the side.

Fig. 7 is a partial enlargement of the ringed detail in fig. 6.

Fig. 8 shows a two-bladed scraper in perspective, obliquely from above.

Fig. 9 shows a cleaning instrument with a two-bladed scraper, moulded as an integral part with a coupling element, in perspective, obliquely from below.

Fig. 10 is an end view of the cleaning instrument in fig. 9.

Fig. 11 shows the cleaning instrument in figures 9 and 10 in perspective, obliquely
5 from above.

Fig. 12 is a partial enlargement of the ringed detail in fig. 11.

Fig. 13 shows, in perspective obliquely from below, the cleaning instrument in
10 figures 9 – 12 partially inserted into the cleaning tool in figures 1 – 4.

Fig. 14 shows, in perspective obliquely from below, the arrangement in figure 13
with the cleaning instrument interconnected with the cleaning tool.

15 Fig. 15 is a partial enlargement of the ringed detail at the top right of fig. 14.

Fig. 16 is a partial enlargement of the ringed detail at the top left of fig. 14.

Fig. 17 shows an alternative design of a cleaning tool in perspective, obliquely
20 from below.

Fig. 18 shows the cleaning tool in fig. 17 in perspective, obliquely from above.

Fig. 19 shows an alternative design of a cleaning instrument in perspective,
25 obliquely from above.

Fig. 20 shows, in perspective obliquely from above, the cleaning tool in figures 17
and 18 interconnected with the cleaning instrument in figure 19.

30 Fig. 21 shows yet another design of a cleaning tool in perspective, obliquely from
above.

Fig. 22 shows yet another design of a cleaning instrument in perspective, obliquely from above.

Fig. 23 shows, in perspective obliquely from above, the cleaning tool in figure 21
5 interconnected with the cleaning instrument in figure 22.

Figures 1 – 4 show a preferred design of a cleaning tool (1) that has a rectangular head (2) and a sleeve (12). A shaft can be inserted in the sleeve. The sleeve (12) can be set at various angles towards the head (2), or be rotatably fixed in the head
10 (2). The head (2) includes an upper coupling element (7) in the form of a U-profile including a web (13) and two flanges (14), said web and flanges forming an essentially U-shaped groove that runs along coupling element 7 from end to end and is open at the bottom. The insides of the flanges (14) have longitudinal
15 recesses in the form of channels (6) that run along coupling element 7 from end to end. On the bottom of both flanges (14) there are recesses (15) arranged at a distance from each end of coupling element 7. These recesses (15) thus form edges (9), said edges (9) being devoted to functioning as locking surfaces for movement in the longitudinal direction of a cleaning instrument inserted into the
20 channels (6). The cleaning tool (1) can be suitably manufactured by injection moulding of a polymer. The material should preferably be of such a thickness that the whole is rigid and keeps its shape on being subjected to the stresses it will normally encounter in use.

Figures 5 – 7 show a preferred design of a lower coupling element (4) that is
25 essentially in the shape of an H-profile with a web (16) and flanges (17). At one end of coupling element 4, a through groove (20) has been cut in the web (16). On both sides of the groove (20), the outsides of the flanges (17) engage projection 18. The outsides of the projection (18) form operating device 41, these together forming operating member 11, the side edges of the projection (18) forming
30 locking surfaces (10), said locking surfaces being directed towards both ends of coupling element 4. The outsides of these flanges (17) also engage longitudinal shoulders (5) that run from end to end of coupling element 4. In figures 6 and 7, the lower coupling element is so oriented that that the lower part of the projection

(18) is facing upwards. Figure 7 shows that the shoulders (5) have bevels (19) that, at interconnection, face upwards in the direction of the upper coupling element (7). The lower coupling element (4) is preferably made of an injection moulded thermoplastic of a type that is relatively rigid and keeps its shape, yet is flexible enough for the ends of the flanges (17) on both sides of the groove (20) to be elastically bent towards each other when acted upon by the compressive forces in the A direction of the arrows as per figure 5.

Figure 8 shows a scraper (21), preferably made of a solid, thermoplastic, flexible, rubber-like material, essentially shaped as a U-profile with two flanges that form two blades (22). The U-profile's web (23) is opened by a through groove (24) that extends along the U-profile so that two relatively small bridges (25) are formed at both ends of the scraper (21). One of these bridges (25) includes a tongue (26), said tongue facing the other bridge. It is preferred that the scraper (21) should be injection moulded onto the lower coupling element (4), thereby being moulded as an integral element of the lower coupling element as per figures 9 – 12, the whole forming a cleaning instrument (3). The advantage is thereby secured of a cleaning instrument that has no dirt pockets and is thus easy to clean and which can even be autoclaved. At the moulding together, the upper part of the blades (22) of the scraper (21) are moulded onto the inside of the flanges (17) of coupling element 4, the tongue (26) being moulded with the edges of the groove (20) in the lower coupling element (4), thereby filling out the groove (20). Furthermore, the scraper (21) projects from both ends of the lower coupling element (4) the projection corresponding to the width of the bridges (25). The reason for the scraper (21) being wider than coupling element 4 is that this makes it possible to get into floor corners, etc. during cleaning work. A similar cleaning instrument (3) with only one blade (22) can, of course, be envisaged. However, it is preferred that the scraper should have two or more blades (22). This makes it possible to achieve considerably more efficient cleaning with a single scraping of the surface that is to be cleaned. A large part of the liquid and the dirt particles left behind by the first scraper blade (22) are picked up by the following scraper blade (22). In principle, the efficiency is double that of a single-bladed scraper. A design such as described above is preferred, each blade being separately moulded together with

coupling element 4. In this way, the "first" blade (22) is not affected when the "second" blade (22) is bent. If both blades (22) were joined to a single web of the same flexible material as the blades, "simultaneous bending" could occur. If this were the case, an unevenness in the surface to be cleaned could lift both the leading and the following blade, thereby impairing the cleaning effect. Because the groove (20) in coupling element 4 is filled by a tongue (26) made of a flexible rubber-like material, it is easy to bend the ends of the flanges (17) towards each other by exerting pressure on operating member (11) in the A direction of the arrows as per figures 9 and 11.

Figure 13 shows how the cleaning instrument (3) is partially interconnected with the cleaning tool (1). The lower coupling element (4) is, in this state, pushed into the U-shaped groove in upper coupling 7 so that the shoulders (5) are inserted in the channels (6). The dimensions are appropriately selected so that there is a certain play between coupling elements 4 and 7, as also between the shoulders (5) and their respective channels (6). This allows interconnection to be effected without significant effort.

Because the shoulders (5) go into the channels (6), they together form a locating arrangement (42) via which coupling elements 4 and 7 are shape-dependently locked in several first directions relative to each other, but not in the head's longitudinal direction. When the cleaning instrument (3) is pushed further into the cleaning tool (1) in the arrow's B direction, the projection (18) comes into contact with the end of the upper coupling element (7). With continued movement of the cleaning instrument (3) in the arrow's B direction, the ends of the flanges (17) are pressed together under the influence of the penetrating bevels (27) on coupling element 7 and the projection (18) can slide into the U-shaped groove in the upper coupling element and then snap-fit into the recesses (15). This interconnection is effected in a single operation without any actuation of an operating member.

Handling is thereby facilitated for the operator.

The locking effect arises through the resilience of the ends of the flanges (17) and through the tongue (26) pressing the projection (18) into the recesses (15) and

thus causing locking surfaces 9 and 10 (of the upper and the lower coupling elements respectively) to engage with each other. Because the normals of the locking surfaces (9 and 10) are aligned in a second direction (the same as or opposite to arrow B) that deviates essentially from the previously mentioned first directions, the coupling elements are shape-dependently locked to each other in all directions, i.e. even in the longitudinal direction of the head (2). Because the upper and the lower locking elements (7 and 4 respectively) include locking surfaces (9 and 10) that are opposed to each other in pairs, this longitudinal locking is in both directions.

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Figures 14 – 16 show the cleaning tool (1) and the cleaning instrument (3) in the interconnected and locked position. As both ends of the upper coupling element (7) engage recesses (15), the cleaning instrument can be pushed in from either end. It is preferred that the shoulders (5) on the lower coupling element (4) should have upward facing bevels (19) as in figure 12. In this way, the lower coupling element (4) can be a snap-fit in the corresponding channels (6) in the upper coupling element (7) in the C direction of the arrow as per figure 14. This is an advantage when manufacturing a complete set that includes cleaning tool 1 and cleaning instrument 3 – these do not then have to be so exactly oriented in relation to each other. Nevertheless, when interconnecting after cleaning and replacing of a cleaning instrument (3), it is preferred that, as earlier described, the shoulders (5) of coupling element (4) should be pushed into the grooves (6) from the short side of the upper coupling element.

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When cleaning and replacing a cleaning instrument (3), the latter is released from the cleaning tool (1) by pressure being exerted on the operating member (11) in such a way that the operator presses the operating devices (41) towards each other in the A direction of the arrows (as in figure 14). This releases the locking surfaces (9 and 10) from each other, and the upper coupling element (7) can then be disconnected from the lower coupling element (4). In this way, the cleaning instrument (3) can be pulled out from the cleaning tool (1) in the arrow's D direction, essentially parallel with the direction of the normals of the locking surfaces (9, 10). Actuation of the operating member (11) is effected by an

essentially rectilinear exertion of pressure by the operator's fingers, the operator using the same grip that separates the cleaning instrument (3) from the cleaning tool (1). This considerably facilitates handling by the operator.

- 5 The resilience of the ends of the flanges (17) can, of course, be brought about in many other ways, for example, by using a separate resilient element. However, owing to manufacturing economies and hygiene requirements, it is an advantage for the entire cleaning instrument (3) to be a single part.
- 10 Other possibilities include: a cleaning instrument (3) with more than two blades; and, naturally enough, a cleaning tool that is integrated with a cleaning instrument that has two or more blades, the cleaning tool, the cleaning instrument and the blades forming a single part. However, it is preferred that the cleaning tool (1) should include an upper coupling element (7) with a locking surface that can
- 15 engage with and be disconnected from a corresponding locking surface on the cleaning instrument (3). In this way, to carry out different cleaning tasks, various types of cleaning instrument (3) with the same appropriate design of lower coupling element (4) can be easily interconnected with the same cleaning tool (1). For example, a scraper with a solid rubber-like blade may be appropriate for one
- 20 task and a scraper with a cellular rubber blade for another. For yet another task, a cleaning instrument in the form of a brush or a mop may be appropriate.

- Figures 17 – 19 show alternative designs of the upper coupling element (7) and the lower coupling element (4), said alternative designs being expressions of the
- 25 same and already explained idea embodied in the invention. Figure 17 shows a cleaning tool (1) that has a head (2) and a sleeve (12), said sleeve being designed for interconnection with a shaft. The head (2) includes an upper coupling element (7) with a rectangular box-shaped element (43) that is open at the bottom and which has two long sides (30) and two short sides (31). Of these long sides (30),
- 30 the front one has a through rectangular recess (15). As per figure 18, the bottom face of the recess (15) forms a locking surface (9). Using the injection moulding of a suitable thermoplastic material that is sufficiently durable and dimensionally stable, the cleaning tool (1) is preferably manufactured as a single part.

Figure 19 shows a cleaning instrument (3) that includes a scraper (21) with two blades (22). The scraper (21) is made of a solid, thermoplastic, flexible, rubber-like material that is injection moulded onto a lower coupling element (4) that is injection moulded in a relatively rigid and durable thermoplastic material. In this way, the scraper (21) is moulded to form a single part with coupling element 4. This coupling element (4) includes a rectangular box-shaped element (44) that is so dimensioned that, with a certain play, it can be inserted, from below, up into the box-shaped upper element (43). Because the upper box-shaped element (43) forms a box that is closed at the top and which has long sides (30) and short sides (31), coupling element 4 becomes locked to coupling element 7. These box-shaped elements (43 and 44) on each coupling element together constitute a locating arrangement (42) via which the coupling elements are shape-dependently locked in several first directions in relation to each other, but not vertically downwards. To completely lock coupling elements 4 and 7 to each other, one of the long sides (17) of the lower coupling element (4) includes an upward facing bar (34) that has a rectangular cross section. This bar (34) forms a leaf spring that can be bent in the arrows' E and F directions. On the upper part of the bar (34), there is an outward directed projection (18) that is so positioned and dimensioned that it fits into the recess (15) in the upper coupling element (7), there being a certain play when the lower coupling element (4) bottoms in the upper coupling element (7). The upper part of the projection (18) has an "insertion bevel" (27), the lower part a locking surface (10) and the outer part an operating member (11).

At interconnection, the box-shaped element (44) of the cleaning instrument (3) is inserted, from below, up into the box-shaped upper element (43) of the cleaning tool (1) in the arrow's C direction. This causes the bar (34), acted on by the insertion bevel (27), to move elastically away in the arrow's E direction until the projection (18) snap-fits into the recess (15) – see figure 20. Coupling elements 4 and 7 are thereby also locked to each other in the vertical direction. The locking effect arises through the resilience of the bar (34) pressing the projection (18), in the arrow's F direction, into the recess (15) and thus causing locking surfaces 9 and 10 (of the upper and the lower coupling elements respectively) to engage with

each other. Because the normals of the locking surfaces (9 and 10) are aligned in a second direction (the same as or opposite to arrow C) that deviates essentially from the previously mentioned first directions, the coupling elements are shape-dependently locked to each other in all directions, i.e. even vertically downwards.

- 5 This interconnection is effected in a single operation without any actuation of an operating member. Handling is thereby facilitated for the operator.

When cleaning and replacing a cleaning instrument (3), the latter is released from the cleaning tool (1) by the operator pressing the operating member (11) in the
10 arrow's A direction (as in figure 20). This releases the locking surfaces (9 and 10) from each other, and the upper coupling element (7) can then be disconnected from the lower coupling element (4). In this way, the cleaning instrument (3) can be pulled out of the cleaning tool (1) in the arrow's G direction. Actuation of the operating member (11) is effected by an essentially rectilinear exertion of pressure
15 by the operator's fingers. The operator can thus actuate the operating member (11) with the same hand that grips the cleaning tool (1) and pull out the cleaning instrument (3) with the other hand, i.e. using the same grip that actuates the operating member (11), the operator can separate the cleaning instrument (3) from the cleaning tool (1). This considerably facilitates handling.

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Figures 21 – 23 show yet another design of the invention. With the lower coupling element (4) including a lower box-shaped element (43) that, in the interconnected position, surrounds a box-shaped element (44) included in coupling element 7, this design is an inverted variant of that exemplified in figures 17 – 20. These box-
25 shaped elements (43 and 44) on each coupling element together constitute a locating arrangement (42) via which the coupling elements are shape-dependently locked in several first directions in relation to each other, but not vertically downwards. To completely lock coupling elements 4 and 7 to each other, one of the long sides (17) of element 44 includes two through grooves (35) that form a
30 bar (34) that has a rectangular cross section (as in figure 21). On the lower part of the bar (34), there is an outward directed projection (18) that is so positioned and dimensioned that it fits into the groove (32) in the lower coupling element (4), there being a certain play when the upper box-shaped element (44) bottoms in the lower

box-shaped element (43) of coupling element 4. The lower part of the projection (18) has an "insertion bevel" (27), the upper part a locking surface (10) and the outer part an operating member (11). The lower box-shaped element (43) is open at the top and has two long sides (30) and two short sides (31). Of these long sides (30), the front one has a through rectangular groove (32). As per figure 22, the upper face of the groove (32) forms a locking surface (9).

At interconnection, the box-shaped element (43) of the cleaning instrument (3) is inserted, from below, upwards into the cleaning tool (1) in the arrow's B direction so that the box-shaped upper element (44) enters the corresponding space in the box-shaped lower element (43). This causes the bar (34), acted on by the insertion bevel (27), to move elastically away in the arrow's E direction until the projection (18) snap-fits into the groove (32) – see figure 23. Because the normals of the locking surfaces (9 and 10) are aligned in a second direction (the same as or opposite to arrow B in figure 22) that deviates essentially from the previously mentioned first directions, coupling elements 4 and 7 are shape-dependently locked to each other in all directions and can be disconnected from each other in the same way as previously described.

The invention can, of course, be further varied in a number of different ways. For example, one possibility is to design the lower coupling element (4) with a projection that has a locking surface which engages elastically with a groove in the upper side of the upper coupling element (7). Alternatively, a design that involves a locating arrangement in the form of pins in one of the coupling elements and holes in the other coupling element could also be considered. An operating member in the form of a slide control is a further possibility. This and other design variants that are obvious to professionals in this area are all within the idea embodied in the invention as it is formulated in the following patent claims.

PATENT CLAIMS

1. Coupling for the releasable interconnection of a cleaning tool (1) and a
5 cleaning instrument (3), the cleaning tool having a rectangular head (2), said
head (2) having an upper coupling element (7) and the cleaning instrument
(3) having a lower coupling element (4), said coupling elements (4 and 7)
having a locating arrangement (42) via which the coupling elements (4 and
10 7), when interconnected, are shape-dependently locked in several first
directions in relation to each other, the whole being **characterised by**:
the coupling having an operating member (11) and one of the coupling
elements (7 and 4) having one locking surface (9) and the other of the
coupling elements (7 and 4) having a second locking surface (10), the
15 normals (perpendiculars) of said locking surfaces (9 and 10) being aligned in
a second direction that deviates essentially from the previously mentioned
first directions, these locking surfaces (9 and 10), in the interconnected state,
being engaged with each other, the locking surfaces (9 and 10) being moved,
on the application of pressure to an operating member (11), to a position
20 relative to each other and in which they are released from each other, it then
being possible to pull the upper coupling element (7) apart from the lower
coupling element (4).
2. Procedure for interconnecting and disconnecting a cleaning tool (1) with/from
a cleaning instrument (3), said procedure being **characterised by**:
25 the operator orienting the cleaning tool (1) in relation to a cleaning instrument
(3) so that a preparatory position is reached from which, via the agency of a
locating arrangement (42), said tool and said instrument can engage with
each other.
- 30 the operator moving the cleaning tool (1) in relation to the cleaning instrument
(3) and, guided by a locating arrangement (42), into a position where a
projection (18) engages with a recess (15) so that the cleaning tool (1) and

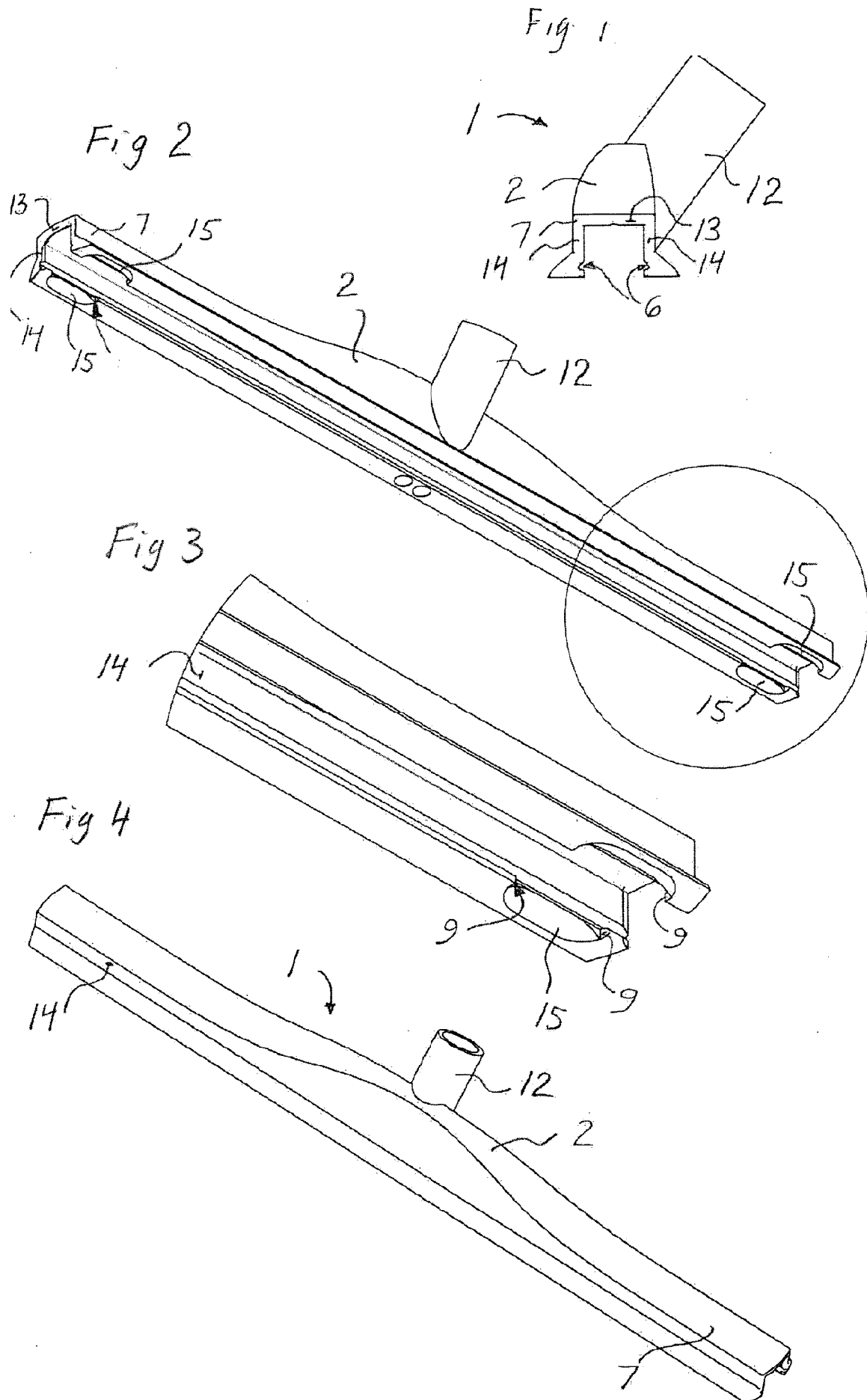
the cleaning instrument (3) are shape-dependently interconnected with each other in all directions.

3. Procedure for disconnecting the cleaning tool (1) that, as per the procedure in patent claim 2, has been interconnected with the cleaning instrument (3), said procedure being **characterised by:**

the operator, via an exertion of pressure on an operating member (11), displacing the projection (18) in relation to the recess (15) and into a position (relative to each other) in which they are disconnected from each other.

the operator separating the cleaning tool (1) from the cleaning instrument (3).

4. Procedure as per patent claim 3, said procedure being **characterised by:** the operator disconnecting the cleaning tool (1) from the cleaning instrument (3) via an exertion of pressure on an operating member (11), the operator using the same grip that separates the cleaning tool (1) from the cleaning instrument (3).



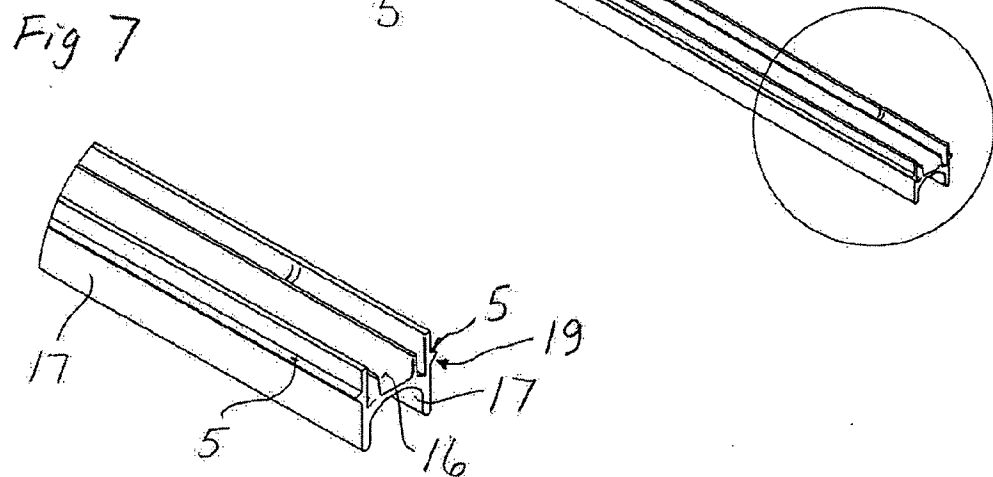
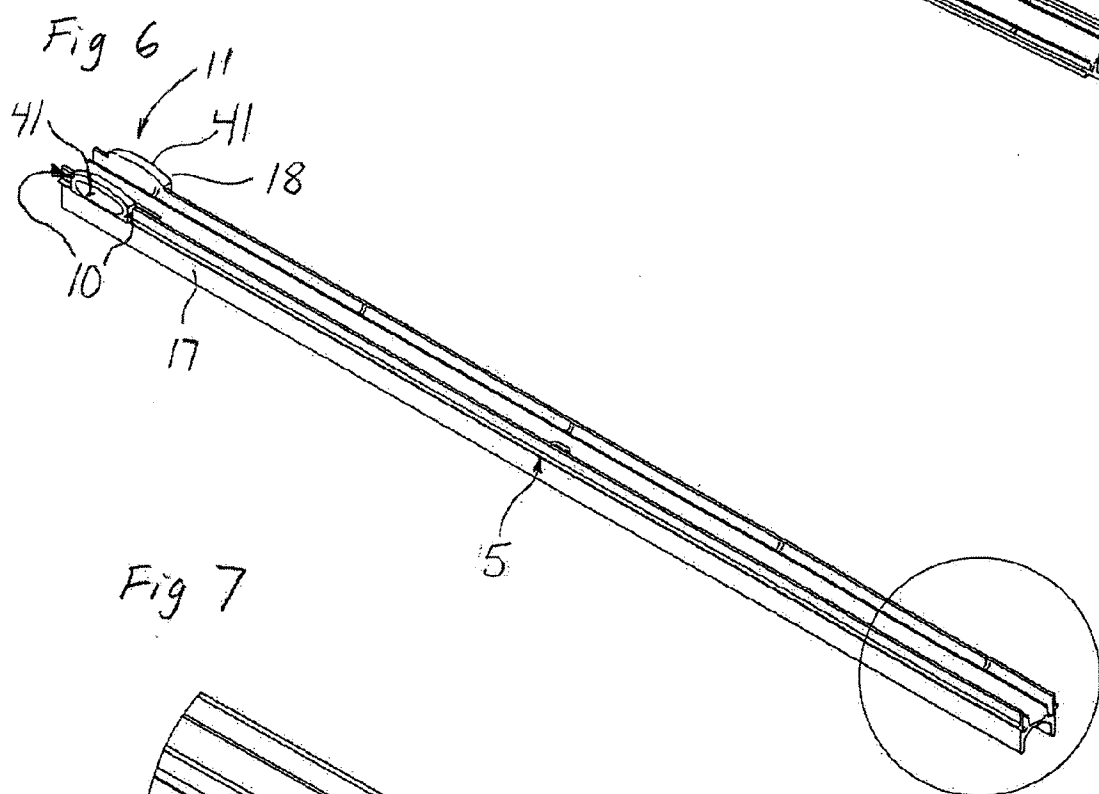
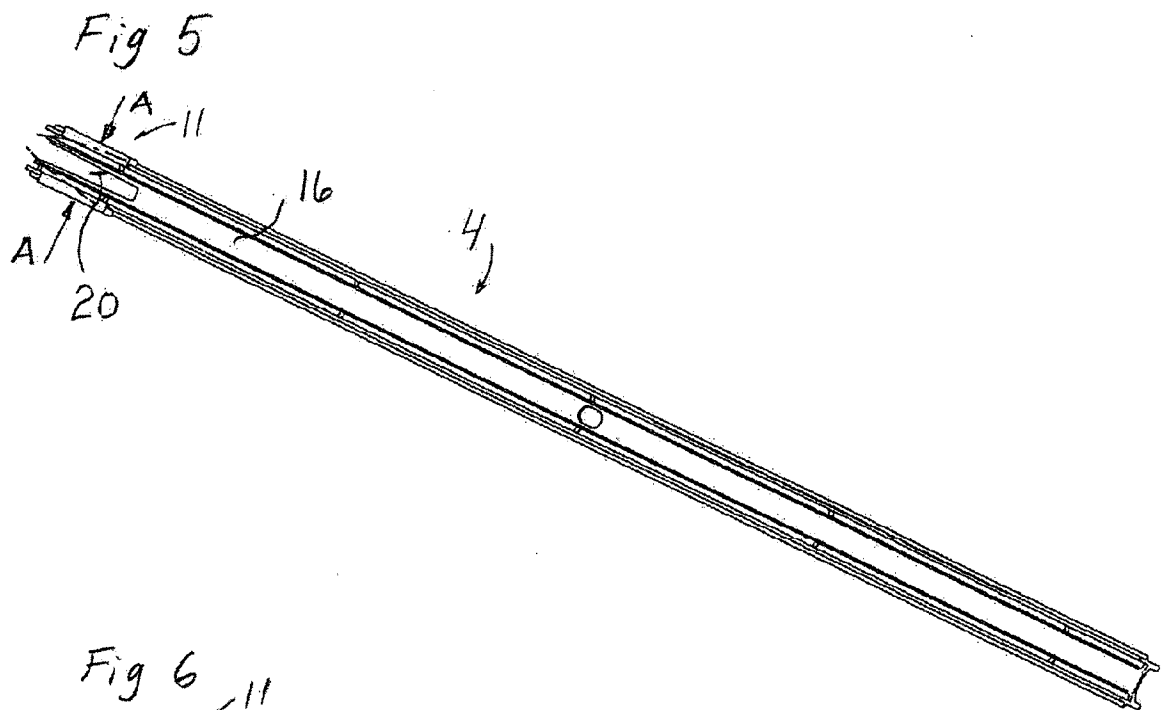
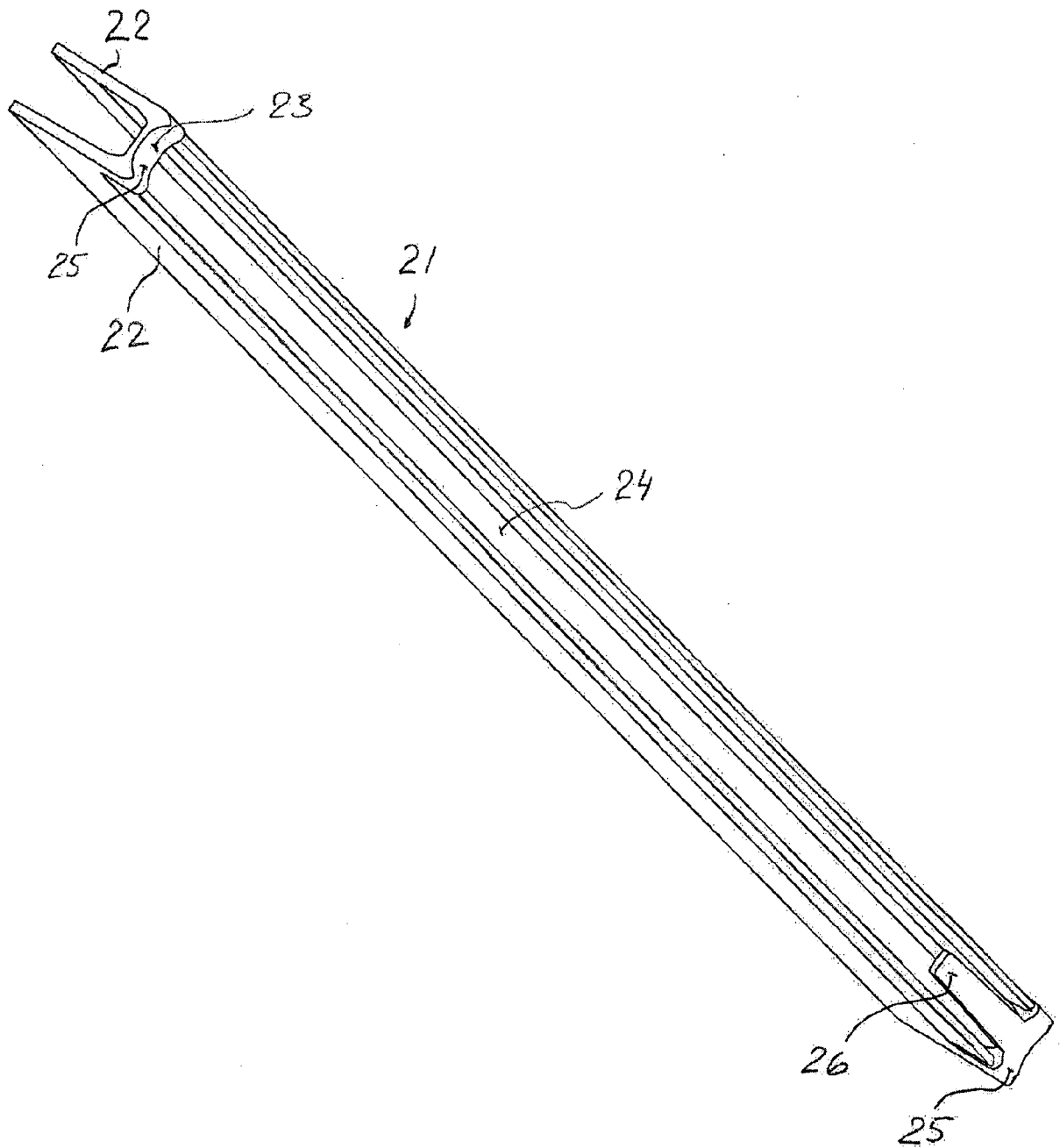
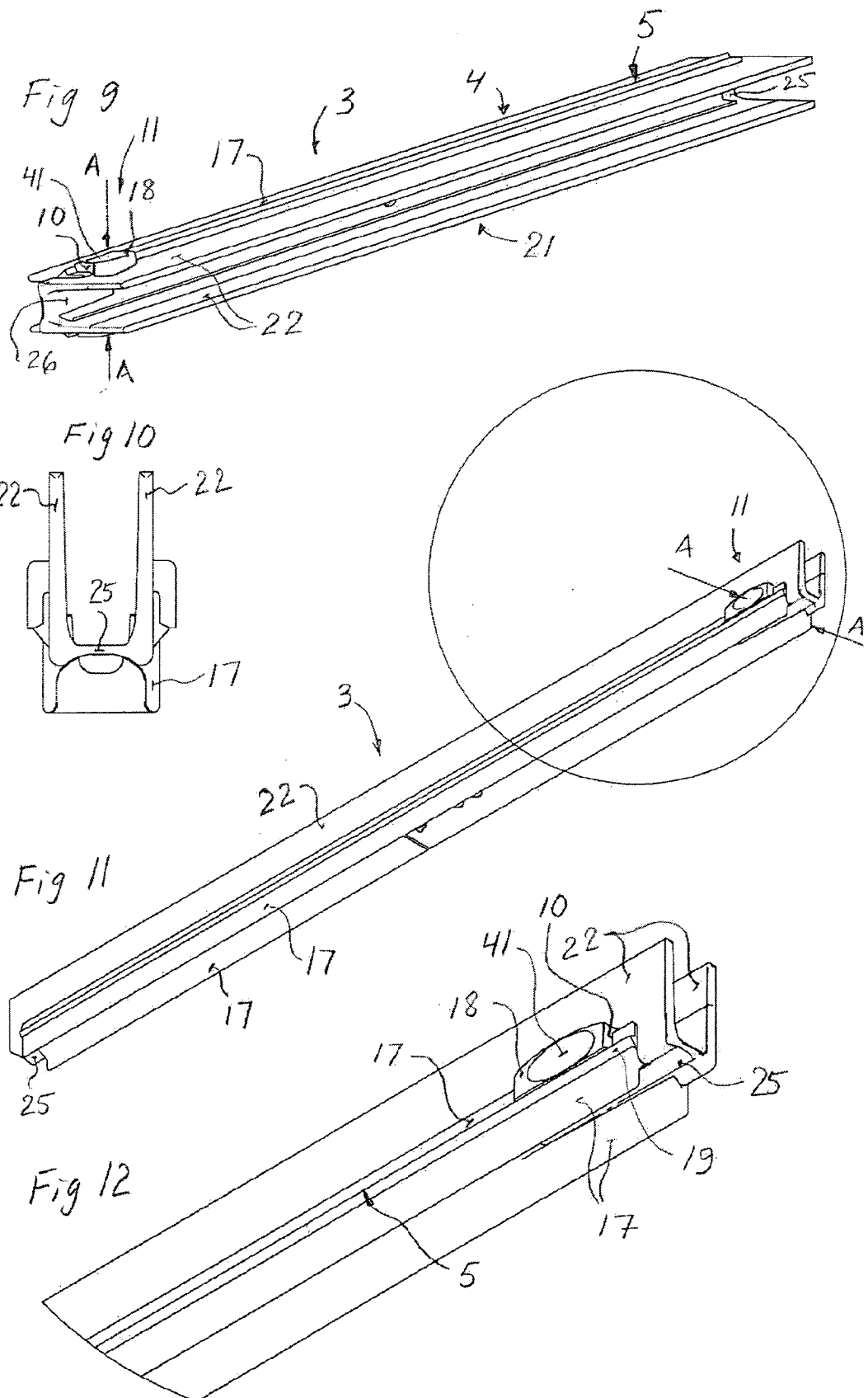
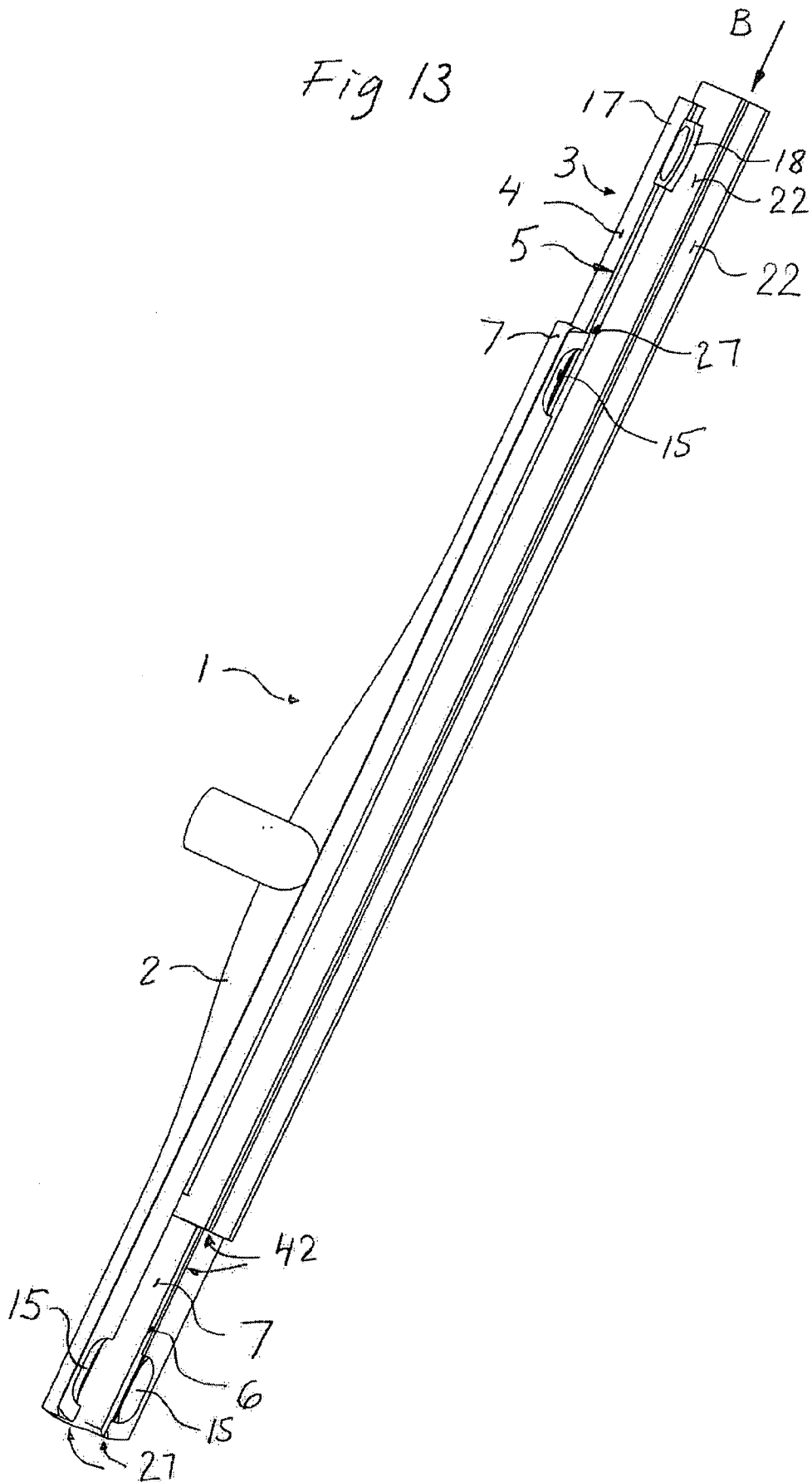
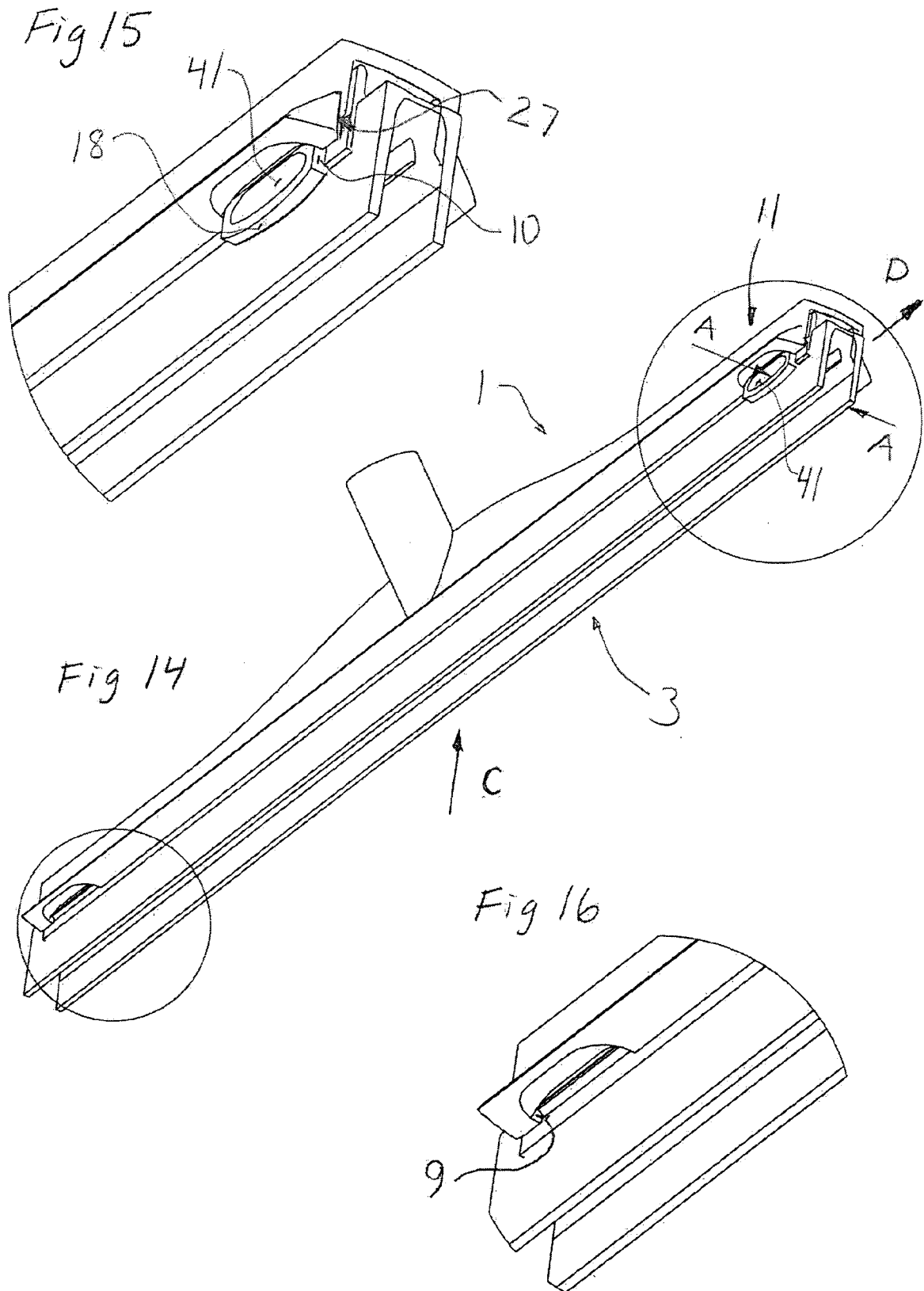


Fig 8









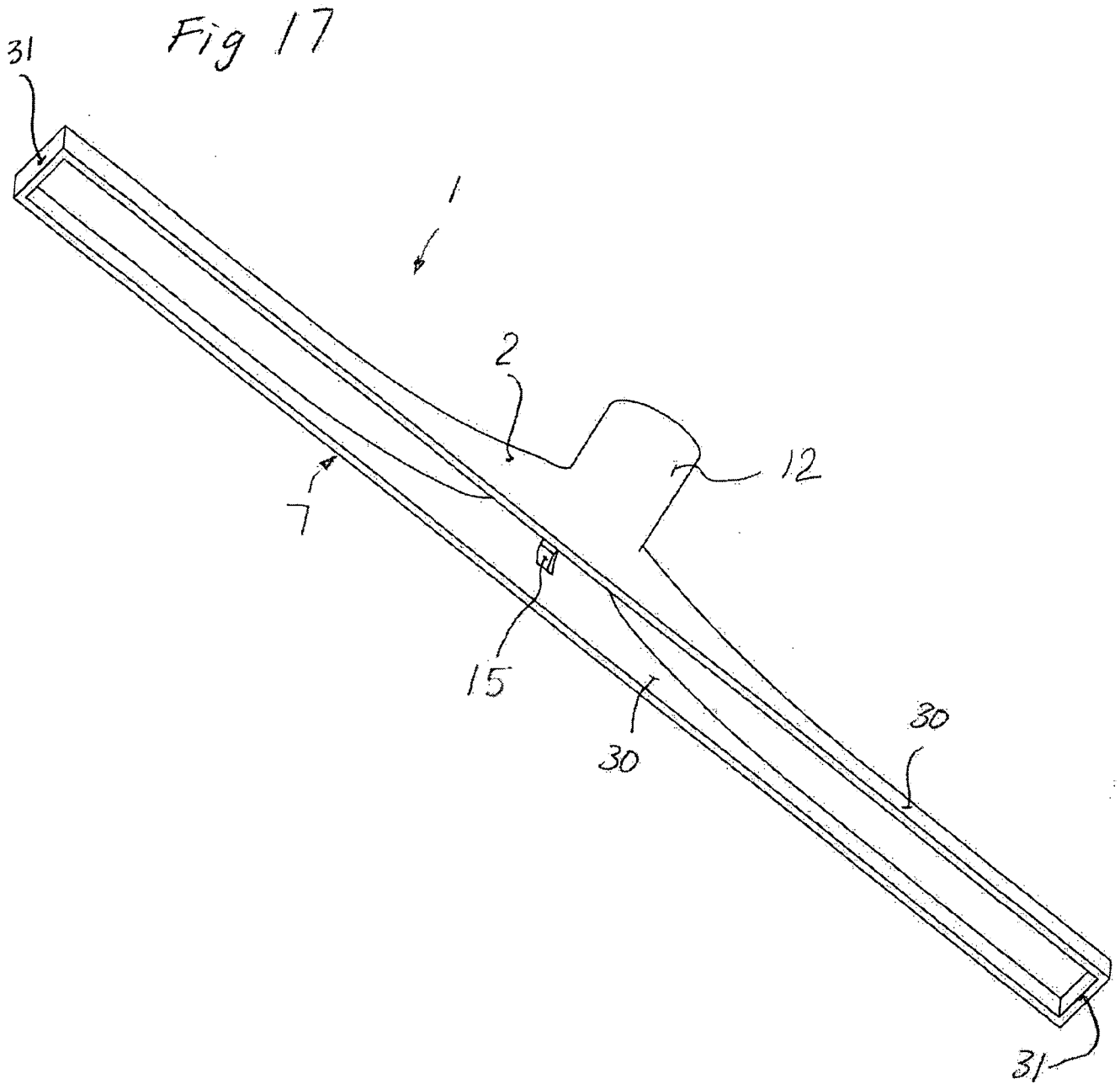


Fig 18

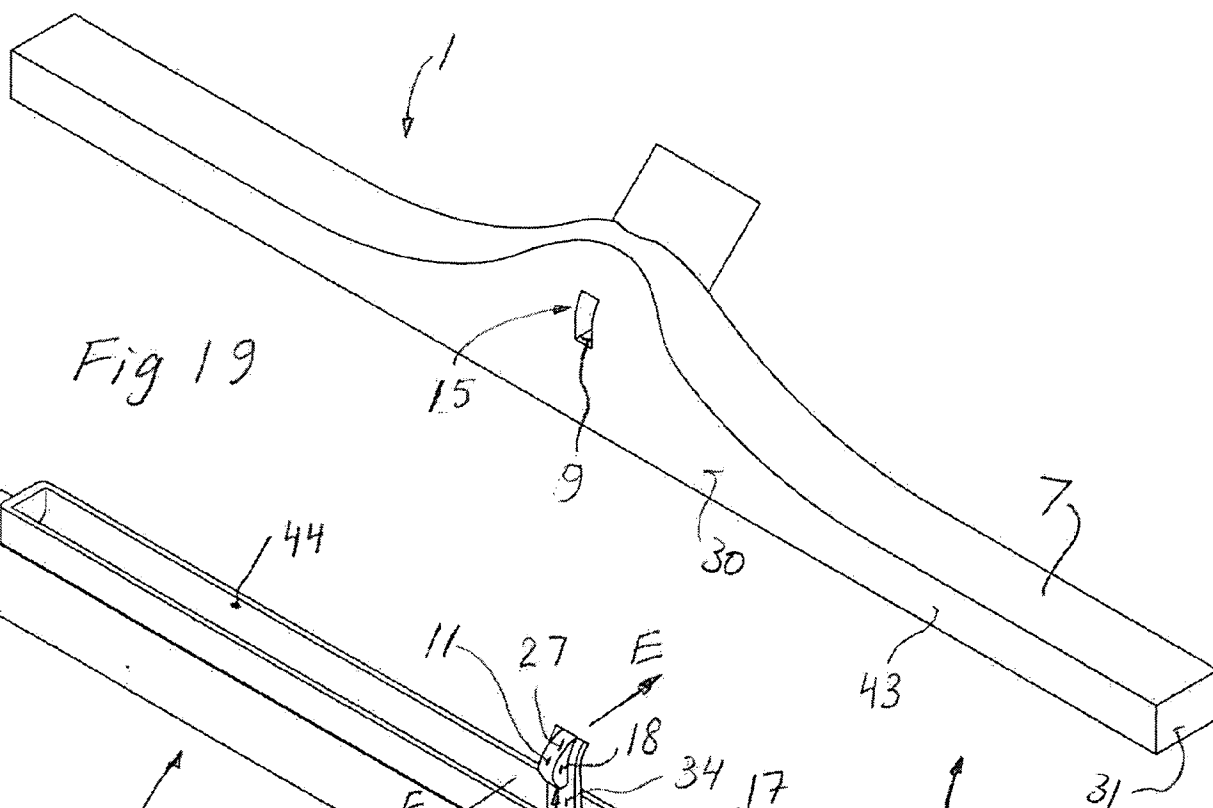


Fig 19

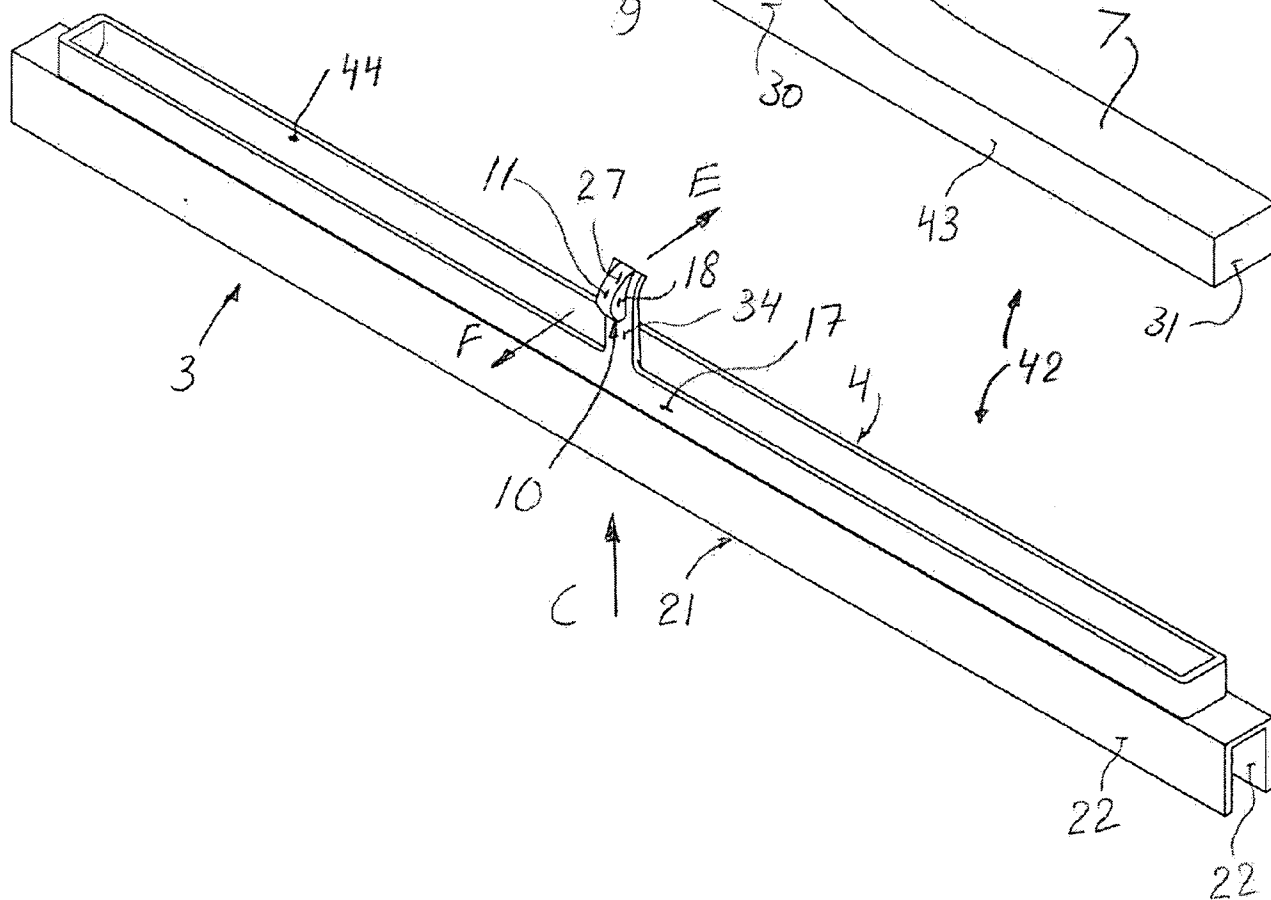


Fig 20

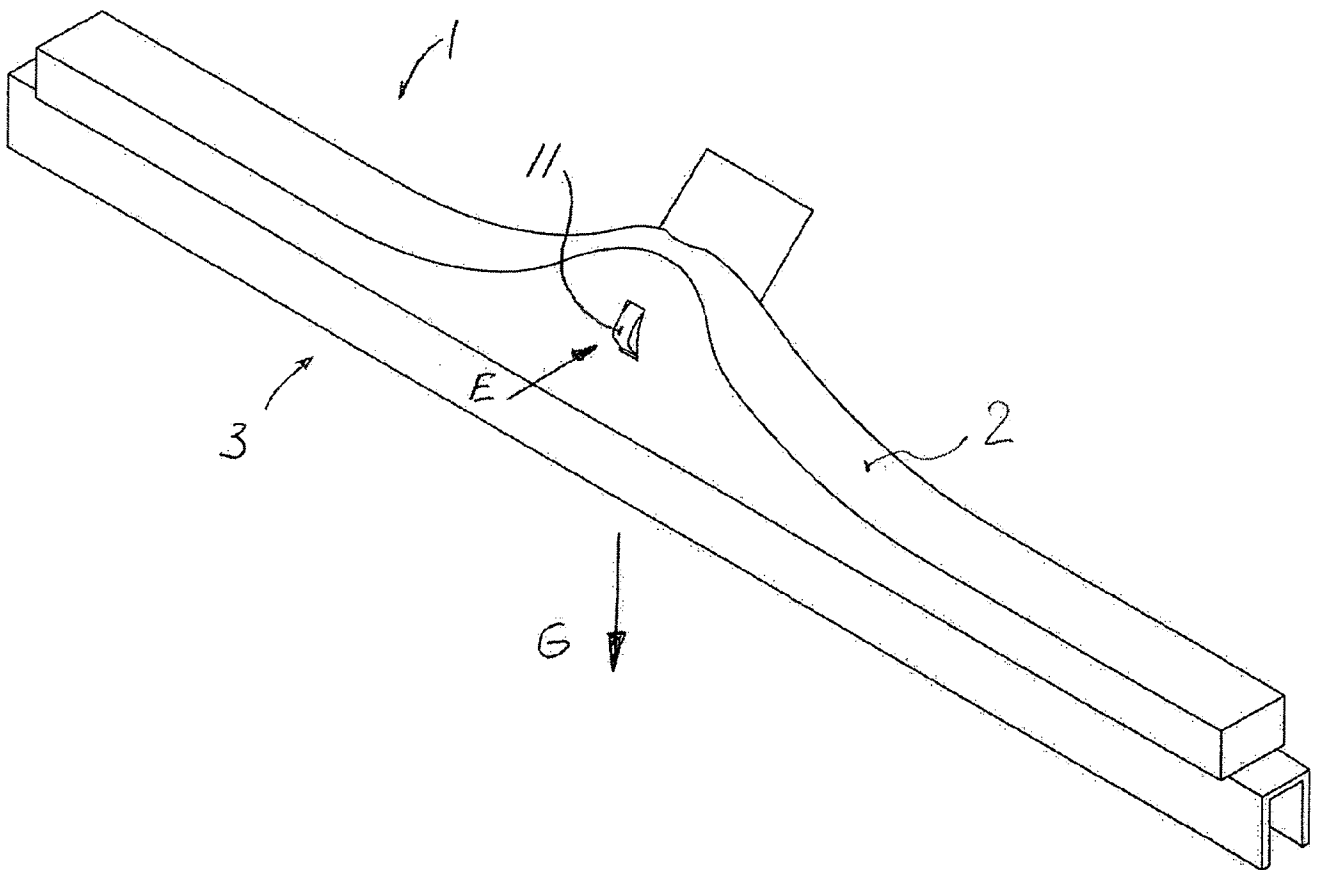


Fig 21

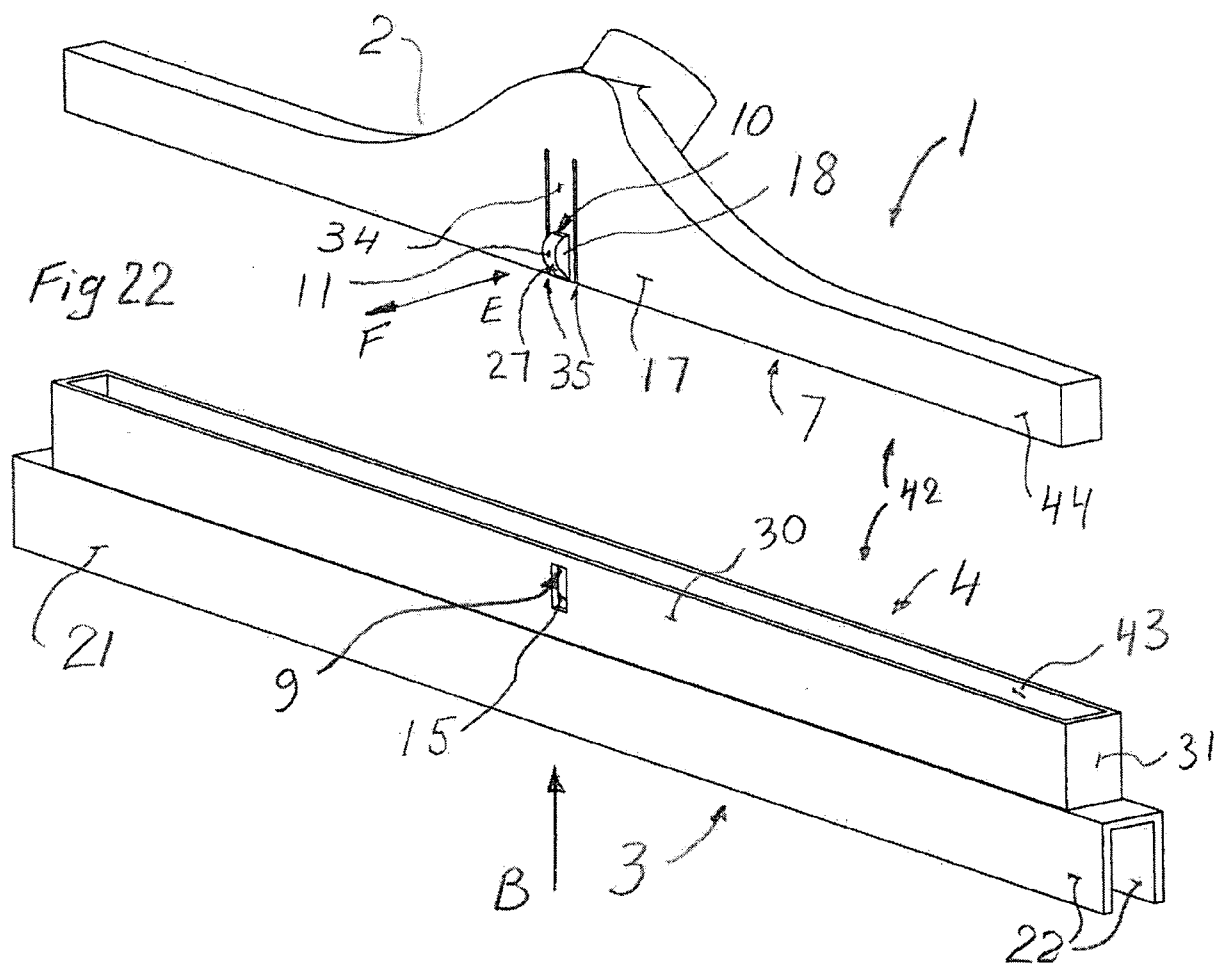
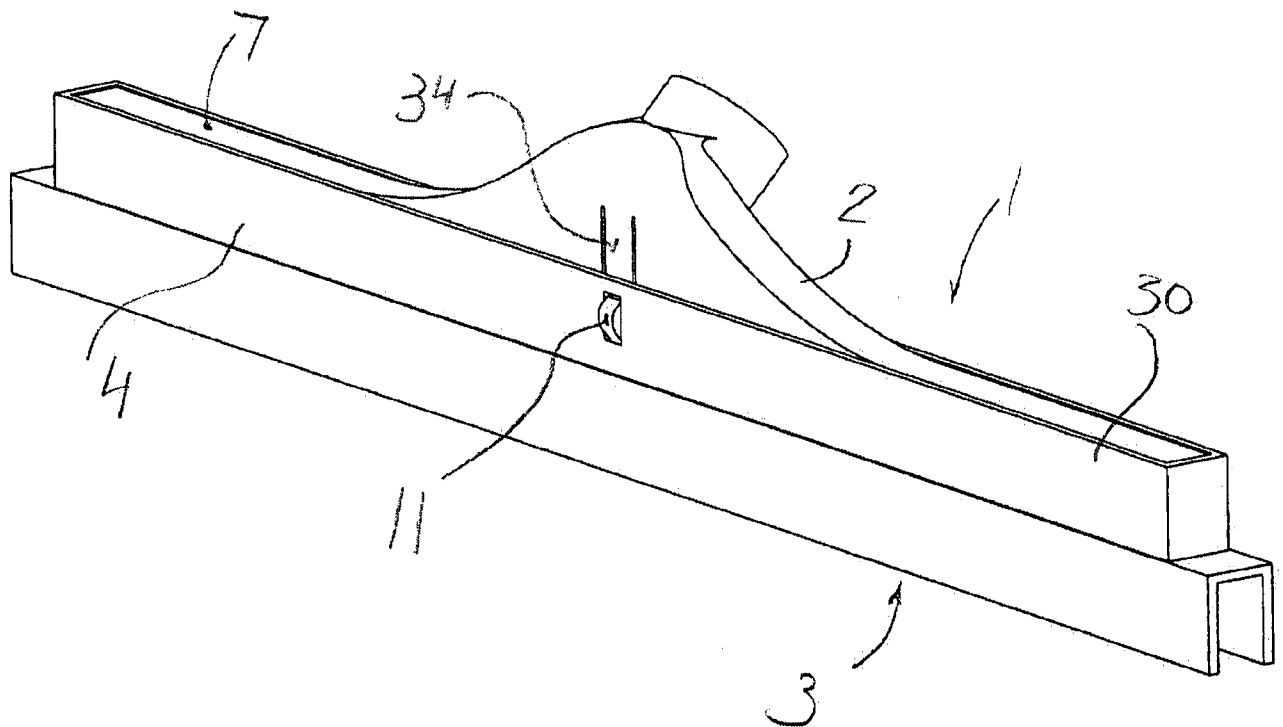


Fig 23



INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2008/003499

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47L, F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2002112941 A, TERAMOTO CORP, 2002-04-16; (abstract) Retrieved from: PAJ database; Original document: Figures 1,3,4,7 --	1-4
X	JP 11076126 A, DUSKIN CO LTD, 1999-03-23; (abstract) Retrieved from: PAJ database; Original document: Figures 1,4,5,7,9,11 --	1-4
X	JP 10314095 A, DUSKIN CO LTD, 1998-12-02; (abstract) Retrieved from: PAJ database; Original document: Figures 1-3 --	1-4

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

19 March 2009

Date of mailing of the international search report

20-03-2009

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2008/003499

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2007190328 A, IWATA SUEZO, 2007-08-02; (abstract) Retrieved from: PAJ database; Original document: Figures 1-3 --	1-4
X	US 4237573 A (G. WEIHRAUCH), 9 December 1980 (09.12.1980), figures 1,4,5, abstract -- -----	1-4

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB2008/003499

US 4237573 A 09/12/1980 NONE
