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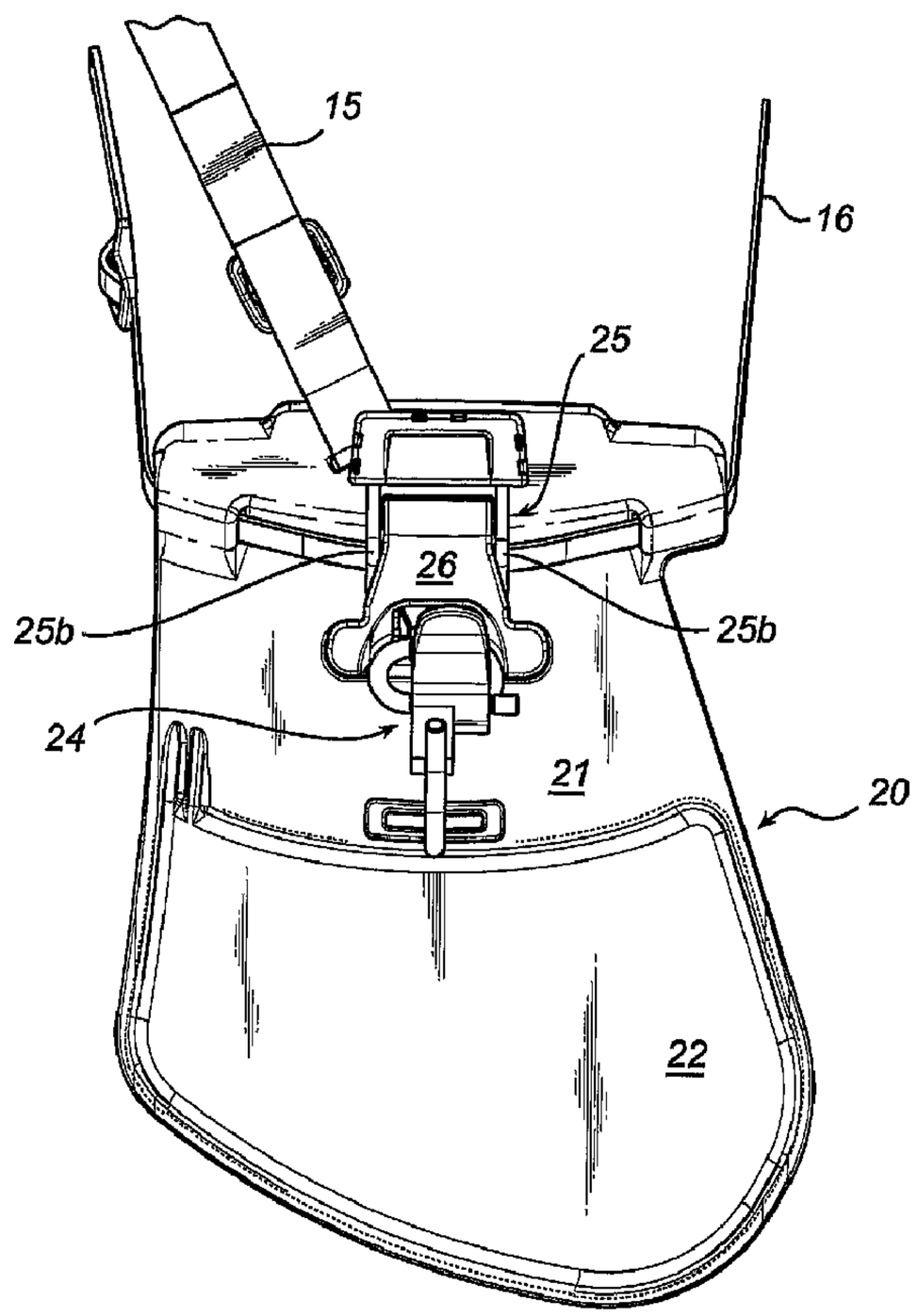
(54) Titre : ENSEMBLE POUR PORTER UN OUTIL PORTABLE ENTRAINE PAR MOTEUR SUR UN HARNAIS
(54) Title: AN ARRANGEMENT FOR CARRYING A HAND-HELD MOTOR-DRIVEN TOOL ON A HARNESS



(57) Abrégé/Abstract:
The present invention deals with an arrangement for carrying a hand-held motor-driven tool on a harness having at least one shoulder strap. The arrangement comprises: a hip pad (20) arranged for connection to a harness (10), the hip pad having a

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(57) Abrégé(suite)/Abstract(continued):
principal surface (21); a hook (24) for receiving a tool; and a clamp (25) for connecting the hook (24) to the hip pad (20), the clamp being arranged at an attachment area (23) of the hip pad, and the clamp being openable such that the hook (24) can be released from the clamp (25). The hook (24) is further connected to the clamp (25) such that it is limited to be movable in a plane that is substantially perpendicular to said principal surface (21) at the attachment area (23) of the hip pad. Thereby, no sliding movement will occur between the hip pad and the hook or the tool, resulting in less wear of the hip pad and the tool.

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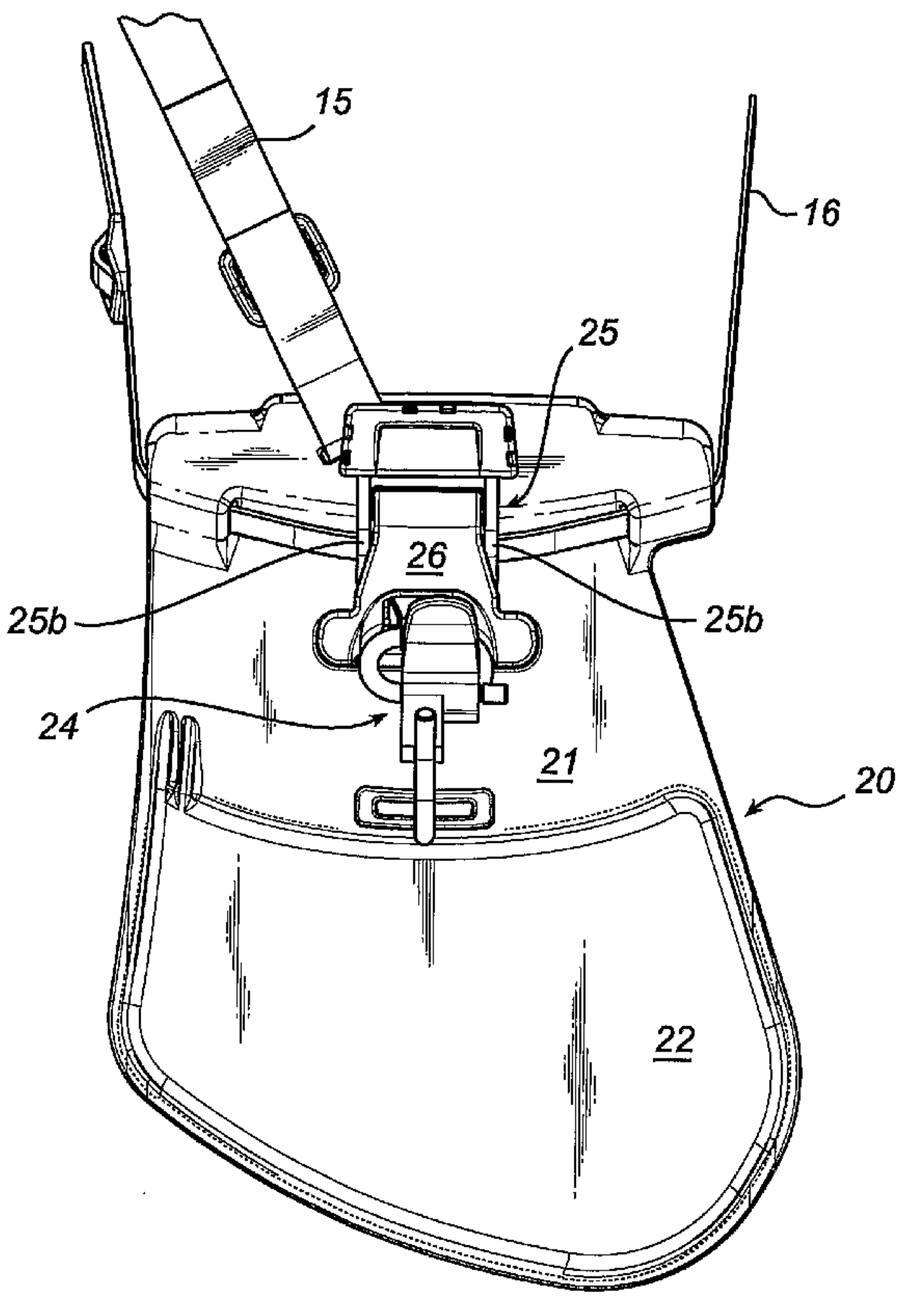

(57) **Abstract:** The present invention deals with an arrangement for carrying a hand-held motor-driven tool on a harness having at least one shoulder strap. The arrangement comprises: a hip pad (20) arranged for connection to a harness (10), the hip pad having a principal surface (21); a hook (24) for receiving a tool; and a clamp (25) for connecting the hook (24) to the hip pad (20), the clamp being arranged at an attachment area (23) of the hip pad, and the clamp being openable such that the hook (24) can be released from the clamp (25). The hook (24) is further connected to the clamp (25) such that it is limited to be movable in a plane that is substantially perpendicular to said principal surface (21) at the attachment area (23) of the hip pad. Thereby, no sliding movement will occur between the hip pad and the hook or the tool, resulting in less wear of the hip pad and the tool.

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AN ARRANGEMENT FOR CARRYING A HAND-HELD MOTOR-DRIVEN TOOL ON A HARNESS

Technical Field

The present disclosure relates to a hand-held motor-driven tool, and especially to an arrangement for carrying such a tool on a harness arranged to be carried by an operator of the tool.

Background

In order to improve working conditions for an operator of a hand-held motor-driven tool, such as a clearing saw, a trimmer, a brush cutter, a chain saw, or the like, the hand-held motor-driven tool can be carried in a harness placed on the back, shoulders and hip of the operator. The use of a harness for carrying the tool reduces the loads on the arms of the operator since most of the weight of the tool is carried by the back, shoulders and legs of the operator instead of by the operator's arms. Thereby, the use of the tool will be less tiring.

In WO02/096239 such a harness is shown, which harness has a hip pad arranged such that, when the harness is worn by an operator, the hip pad hangs down from the rest of the harness and is placed close to one of the hips of the operator. The hip pad has a hook for receiving a tool. The hip pad is used for protecting the operator from the tool and for supporting the tool on the hip of the operator.

For safety reasons it must be possible to release the tool from the operator in an easy way. For this reason, the hook of WO02/096239 has a loop onto which a

flat strap is permanently fastened. The strap is put between a clasp secured to the hip pad and a plate of the hip pad. When the strap is positioned in the clasp, the strap is pressed between the clasp and the plate, thereby securing the tool to the hip pad. The clasp is arranged so that it is easy for an operator to open. When the clasp is opened, the strap is released from the hip pad and the hook with the strap, and thereby also the tool, will drop to the ground due to gravitation.

Although this arrangement has lots of advantages, there is a problem that the tool will slide onto the hip pad when an operator moves, which operator wears a harness with a hip pad on which the tool is arranged. This sliding between the tool/hook and the hip pad will cause wear on the hip pad, and wear on the part of the tool in contact with the hip pad at the sliding movement. Also, because the hook and the tool may bear against different parts of the hip pad, an uneven load on the hip pad may occur, which results in an uncomfortable feeling for the operator of the tool. In an extreme case, the tool may end up outside the hip pad as the operator moves. This would be quite uncomfortable for the user, as the tool and/or the hook will bump into the body of the user.

Summary

An object of the invention is to create an arrangement for carrying a tool on a harness, which avoids the above-mentioned problems, but still provides a reliable release mechanism for releasing the tool from the harness.

According to some embodiments of the present invention, the attachment device is limited to be movable

in a plane that is substantially perpendicular to a principal surface of the hip pad at an attachment area of the hip pad, onto which attachment area a clamp for connecting the attachment device to the hip pad is arranged. Thereby, the above-mentioned problem is avoided, and at the same time, the arrangement provides a reliable release mechanism for releasing the tool from the harness. The attachment member will thereby bear against substantially the same position of the hip pad regardless of movement of the operator of the tool such that any sliding movement of the attachment member and the tool onto the hip pad is avoided. This would result in less wear of the hip pad and of the tool and consequently a longer life of the hip pad and the tool, and a more convenient usage for the operator. Also, there is no risk that the tool would end up outside the hip pad.

By the term "hip pad" is meant any means with the purpose of protecting an operator of the tool, onto which hip pad the tool can be arranged, such that the hip pad is arranged between the tool and the operator.

By the term "attachment device for receiving a tool" is meant any attachment device arranged for receiving a tool, such as for example a hook, clutch, hitch or loop. As an alternative, a hook may be fixedly arranged on the tool, such that it may be hooked onto a loop attached to the clamp. In this case, the loop would be the attachment device arranged for receiving a tool.

By the term "clamp" is meant any means for connecting the attachment device to the hip pad such that the attachment device can be released from the clamp when the clamp is opened, such as a clasp or loop with an open end.

By the term "principal surface of the hip pad" is meant the main surface of a side of the hip pad, which side faces away from an operator of the hip pad, when the hip pad is worn by the operator, or the remaining surface of the side of the hip pad, if attached devices and protruding parts are removed, i.e. a plain hip pad.

If an arrangement for carrying a hand-held motor-driven tool on a harness is used together with a hip pad that is movable in relation to the harness, for example along a rope or strap connected to the harness, the tool will be very easy to operate, because it can be moved by an operator in any wanted direction, without the attachment device sliding on the hip pad.

By arranging the attachment device to be rotationally movable in a plane perpendicular to the hip pad, a good mobility is achieved for the tool when attached to the attachment device, without the attachment device sliding on the hip pad.

According to some embodiments of the present invention, the attachment device is rotationally movable around an axis provided by the clamp. By having a rotational movement for the attachment device around an axis of the clamp, the total number of necessary parts for the arrangement would be low, resulting in a cost-effective and fail-safe arrangement.

According to some embodiments of the present invention, the attachment device can be easily and reliably released from the hip pad by an operator of the tool opening the clamp of the arrangement.

According to some embodiments of the present invention, the clamp is rotationally movable around its axis for opening the clamp and releasing the tool. This provides an easy and reliable way of releasing the tool.

Also, since the same axis is used for rotational movement of the attachment device and the clamp, a cost-efficient arrangement is achieved. In addition, the release mechanism is extra reliable since there are no additional mechanisms used.

Some embodiments of the present invention provide advantageous embodiments for achieving a reliable release mechanism for the attachment device. In some embodiments of the present invention, the attachment device comprises a link for releasably attaching the attachment device to the clamp. Thereby, two points of rotation are achieved, one point of rotation between the clamp and the link and one point of rotation between the link and the attachment device. Such an arrangement would result in better radial range for the operator of the tool, and still the movement of the attachment device will be limited to a plane perpendicular to the principal surface of the hip pad.

Some embodiments of the present invention further comprise a guide arranged at the hip pad, which guide is arranged for widening the openable end of the clamp when the clamp is opened. Thereby, a spring effect is achieved for opening the clamp, which means that the risk of the attachment device and the tool accidentally being falsely released from the hip pad is low.

By such an arrangement, the clamp would be a lever for the operator to use when opening the clamp and releasing the tool, resulting in an arrangement that is easy to use, cost-effective and reliable.

According to some embodiments, the guide is arranged such that the clamp can stay in an open position after an operator of the tool has opened the clamp. This reduces

the risk that the clamp snaps back into a closed position before the attachment
device is released from the clamp. Also, this facilitates for an operator to put the attachment device back onto the clamp again.

According to another aspect of the invention, a harness comprising a hip pad is provided.

Brief Description of the Drawings

The invention will in the following be described in more detail with reference to the enclosed drawings, wherein:

Figure 1 shows a perspective view of a harness with a hip pad according to prior art;

Figure 2 shows a front view of an embodiment of the arrangement of the invention;

Figure 3 shows a side view of an embodiment of the arrangement of the invention;

Figure 4 shows an exploded view of an embodiment of the arrangement of the invention;

Figure 5 shows a front view of an enlargement of a part of the embodiment of the invention shown in figures 2-4;

Figure 6 shows a front view of an enlargement of another part of the embodiment of the invention shown in figures 2-4.

Description of Embodiments

The present invention will be described in more detail hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather,

these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, like numbers refer to like elements.

In figure 1 is a harness 10 shown having an arrangement for carrying a hand-held motor-driven tool, for example a brush cutter, a chain saw or that like according to prior art.

An operator, like a forest worker or that like, is intended to wear the harness 10.

The harness 10 comprises, among other things, two shoulder straps 11, a back plate 12, a relieving belt 13 and a hip pad 20. The hip pad 20 is arranged for protecting an operator from the tool.

The shoulder straps 11 are arranged to the upper part of the back plate 12 extending from the back plate 12. When the harness 10 is carried by an operator, the back plate 12 is put on the back of the operator, and the shoulder straps 11 extend over the shoulders of an operator. Each shoulder strap 11 is arranged with a buckle 11a and 11b respectively.

The relieving belt 13 is arranged to the lower part of the back plate 12.

A waist strap 14 comprising a bracket 14a can be arranged to the harness 10 in order to further improve the fit of the harness 10.

The hip pad 20 is attached to the harness 10 by means of a catching belt 15. A guide strap 16 is further attached between the hip pad 20 and the back plate 12 in order to make the hip pad 20 movable. The guide strap 16 is in a first end 16a attached to the harness 10.

When the harness is carried by an operator, a second end 16b of the guide strap 16 is fastened to the buckle

11b of one of the shoulder straps, and the buckle 11a of the other shoulder strap is fastened to the bracket 14a, and the buckles 11a and 11b are attached to each other over the breast of an operator.

The hip pad 20 is further arranged with an attachment element 17, for example in form of a hook. The tool is arranged to be attached to the harness 10 by means of the attachment element 17.

In the embodiment of the invention described in the figures 2-6, an arrangement for carrying a hand-held motor-driven tool on a harness is shown, which arrangement is adapted to be arranged to a harness, for example to a harness according to the description in figure 1.

The arrangement comprises a hip pad 20 for protecting an operator from a tool (not shown) arranged in an attachment device 24 in form of a hook, which attachment device is releasably attached to the hip pad 20. The hip pad is arranged to rest on an area of an operator comprising the hip of the operator, when the operator uses the hip pad. The hip pad 20 has a principal surface 21, which surface 21 faces away from the leg/hip of an operator, when the hip pad is used by the operator. The hip pad 20 is preferably substantially flat and slightly bent to adapt to the shape of a hip of an operator. The hip pad also has a part 22, which may be reinforced to stand the strain provided from a tool attached to the hook.

The arrangement for carrying a tool on a harness according to an embodiment of the invention comprises the hip pad 20, an attachment device 24 in shape of a hook, a clamp 25, a guide 26 and a link 27.

As could be understood from figures 2, 3 and 4, the guide 26 is arranged onto an attachment area 23 of a principal surface 21 of a front side of the hip pad. With the front side of the hip pad is meant the side facing away from a user of the hip pad, when the hip pad is worn by the user.

The guide 26 is attached, e.g. screwed, onto the hip pad together with an attachment member 28 arranged on a back side of the hip pad and an arrangement member protruding from the attachment area 23 of the front side of the hip pad. The guide 26 is arranged onto the hip pad such that it keeps an openable end 25a of the clamp 25 in place between the guide 26 and the arrangement member protruding from the attachment area 23, and such that the clamp is rotationally movable around an axis provided by the openable end 25a of the clamp. The axis provided by the openable end 25a of the clamp preferably has an extension substantially parallel to the principal surface 21 of the hip pad at the attachment area 23 of the hip pad, and a an extension substantially parallel to a width of the hip pad, which width could be defined as a substantially horizontal extension when the hip pad is positioned in a standard usage position onto an operator.

The openable end 25a of the clamp is arranged to carry the link 27, when the openable end 25a of the clamp is in a closed position. The link 27 is in turn arranged to carry the hook 24, and the hook is in turn arranged to carry a hand-held motor-driven tool (not shown).

The link, and consequently the hook and the tool attached to the hook, will be rotationally movable around the axis provided by the openable end of the clamp, i.e. in a plane that is substantially perpendicular to the principal surface 21 of the hip pad in an attachment area

23 of the hip pad. The hook may also be rotationally movable around an axis of the link, which axis is substantially parallel to the axis provided by the openable end of the clamp. Thereby, the tool will be arranged conveniently onto the hip pad and the hook will not risk sliding onto the hip pad, which would increase the life of the hip pad. The arrangement also provides a reliable attachment of a tool to a harness, wherein the tool can be easily released from the harness. Although the tool is limited to be movable in a plane substantially perpendicular to the principal surface of the hip pad, the tool might have a small movability in a direction parallel to the principal surface, and still achieve the purpose of the invention. The small movability in a parallel direction may be due to e.g. play between the different parts of the arrangement of the invention.

The arrangement described has the following function:

When a tool is attached to the hook 24, the clamp 25 is in a closed position and the link 27 comprising the hook 24 and the tool will hang onto the openable end 25a of the clamp. If an operator of a tool needs to release the tool from the harness 10, he pushes the clamp 25 into an open position such that the openable end 25a of the clamp is opened. Then the link 27 will not be carried by the openable end of the clamp anymore, and the link, the hook 24 and the tool will fall to the ground by gravity.

An embodiment of the invention will in the following be described in more detail with reference to figures 2-5.

Figure 5 shows an embodiment of the clamp of the invention. The clamp 25 comprises two substantially

parallel portions 25b joined at a closed end with a crossbar 25d. The two substantially parallel portions 25b each leads into the openable end 25a of the clamp. The openable end 25a comprises two protruding portion 25a1, 25a2. Each parallel portion 25b leads into a protruding portion 25a. The protruding portions 25a1, 25a2 protrudes substantially perpendicular to the parallel portions and in a direction towards each other. The two protruding portions 25a1, 25a2 forms the openable end 25a of the clamp. There may or may not be an open space between the protruding portions, when the clamp is in the closed position. The clamp also has a handle 25c, provided as two plates arranged at the closed end of the clamp for facilitating the use of the clamp by an operator, (see figure 4). The clamp is preferably made by a metal that makes the two parallel portions expandable.

Figure 6 shows an embodiment of the guide 26 according to the invention. The guide comprises a first, tapered section 26a, a second section 26b, an upper section 26c and a stop section 26d. The upper section 26c leads into a narrow part of the tapered section 26a and a broad part of the tapered section 26a leads into the second section 26b. The second section is adapted for receiving the parallel portions 25b of the clamp, such that the clamp will stay in an open position after it has been opened. For this reason, the second section 26b may either have a straight shape, i.e. it will have two parallel edges or it may have a tapered shape, in which case the second section will be tapered in a direction leading away from the tapered section. The second section leads into a stop section, arranged e.g. for stopping the movement of the clamp when it has reached an open position. For this reason, the stop section has edges

substantially perpendicular to the movement of the parallel portions 25b of the clamp.

The link 27 has a closed end 27a, which when a tool is carried in the harness is arranged onto the two protruding portions 25a1, 25a2 of the openable end 25a of the clamp. The link also has an open end 27b arranged to receive a closed loop 24a of the hook 24. The open end 27b may also be closed. In that case, the link 27 will provide a closed loop and the hook 24 will be permanently arranged on the link 27. If the link has an open end 27b, the open end is preferably closed when the hook 24 has been arranged on the link 27, such that the hook cannot fall off the link.

The hook 24 is arranged for carrying a tool. The closed loop 24a of the hook is arranged to be inserted in the open end of the link, as mentioned above. The hook also has a snap arrangement 24b for securing that the tool is kept on the hook when it is inserted onto the hook. For this reason, the snap arrangement 24b can be opened by the tool when the tool is inserted, but the tool itself cannot accidentally open the snap arrangement once the tool has been inserted onto the hook. Although, the snap arrangement 24b can be opened by the operator if the operator wants to take the tool off the hook.

When an operator of a tool needs to release the tool from the harness, he opens the arrangement of the invention by pushing the handle 25c of the clamp downwards, i.e. in a direction towards the hook 24. Then the clamp will perform a rotational movement around the axis provided by the two protruding parts 25a1, 25a2 of the clamp. At the same time, the two parallel portions 25b of the clamp will slide on the tapered section 26a of the guide in a direction towards the broadest part of the

tapered section. This movement will cause the two protruding parts 25a1, 25a2 to move away from each other, such that the clamp opens. When the clamp has been opened to such an extent that the link will not be carried by the clamp anymore, the tool, the hook 24 and the link 27 will fall to the ground by gravity. When pushing the clamp downwards, the two parallel portions 25b of the clamp will slide onto the tapered section 26a of the guide from a narrow part to the broadest part of the tapered section and into the second section 26b of the guide. Since the second section 26b has parallel edges or is tapered in the opposite direction compared to the tapered section 26a, the clamp 25 will stay in this open position, and there will be no risk that the clamp snaps back into the closed position before the tool has fallen off from the harness.

When the operator of the tool wants to bring the tool back onto the harness again, he inserts the link 27 and the hook back into an opening 26e formed by the stop section 26d of the guide and the arrangement member at the attachment area 23 of the hip pad. The opening 26e is formed such that it facilitates the insertion of the link and hook, for example with a semi-circular cross-section, such that the attachment area 23 of the hip pad and the guide 26 together guides the insertion of the link and the hook into the opening. When the link 27 and the hook 24 have been inserted into the opening, the operator moves the handle 25c of the clamp upwards again, in the opposite direction compared to when the clamp was opened, such that the protruding parts 25a of the clamp are moved back towards each other again, such that the clamp receives its closed position again. Now the tool can be inserted onto the hook again and carried by the harness.

In another embodiment of the invention the link 27 is omitted. In this case the hook is arranged such that it can hang directly onto the openable end 25a of the clamp.

The arrangement according to the invention is especially usable if it is used together with a hip pad that is movable along a guide strap or rope 16. Then the tool will be easy to handle when attached to the hook without risking a sliding movement of the hook onto the hip pad, which would wear out the hip pad.

The hip pad is arranged to be connected to a harness such that the hip pad protects a region around a hip of the operator, when the harness is worn by the operator. An example of such a harness shown in figure 1. Although, other types of harnesses may be used: from the simplest kind of harness comprising only one shoulder strap which extends down to a lower portion onto which the hip pad is arranged, to more complex harnesses, such as the harness shown in figure 1.

In the drawings and specification, there have been disclosed preferred embodiments and examples of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation, the scope of the invention being set forth in the following claims.

CLAIMS

1. An arrangement for carrying a hand-held motor-driven tool on a harness having at least one shoulder strap, the arrangement comprising:

a hip pad arranged for connection to a harness, the hip pad having a principal surface;

an attachment device for receiving a tool;

a clamp for connecting the attachment device to the hip pad, the clamp being arranged at an attachment area of the hip pad, and the clamp being openable such that the attachment device can be released from the clamp;

wherein the attachment device is connected to the clamp such that the attachment device is substantially limited to be movable in a plane that is substantially perpendicular to said principal surface at the attachment area of the hip pad,

wherein the clamp has an openable end onto which the attachment device is connected, which openable end can be opened such that the attachment device can be released from the clamp.

2. Arrangement according to claim 1, wherein the attachment device is connected to the clamp such that the attachment device is arranged for rotational movement in the plane substantially perpendicular to the principal surface at the attachment area of the hip pad.

3. Arrangement according to claim 2, wherein the clamp provides an axis, and wherein the attachment device is connected to the clamp such that the attachment device is

arranged for rotational movement around the axis provided by the clamp.

4. Arrangement according to claim 1, wherein the clamp provides an axis and wherein the clamp is arranged for rotational movement around the axis for opening the openable end of the clamp such that the attachment device is released from the clamp.

5. Arrangement according to claim 4, wherein the openable end of the clamp has two protruding portions, protruding in a direction towards each other, the protruding portions providing the axis of the clamp, and wherein the attachment device is connected to the two protruding portions such that when the clamp is opened, the two protruding portions are moved away from each other.

6. Arrangement according to claim 5, wherein the attachment device comprises a link, the link having one end releasably arranged at the two protruding portions of the clamp when the clamp is in the closed position.

7. Arrangement according to any one of claims 1 and 4-6, wherein the arrangement further comprises:

a guide arranged at the hip pad, which guide is arranged for opening the openable end of the clamp when the clamp is opened.

8. Arrangement according to claim 7, wherein the guide has at least one section with a tapered shape, and the clamp has two substantially parallel portions leading to

the openable end of the clamp, the two substantially parallel portions of the clamp being arranged to bear against the guide, and, when the clamp is opened, the two substantially parallel portions are arranged to slide on the guide from a narrow part of the at least one section of the guide towards a broad part of the at least one section of the guide such that the tapered shape of the at least one section of the guide forces the openable end of the clamp to widen.

9. Arrangement according to claim 8, wherein the guide has a second section extending from the broad part of the at least one section with a tapered shape, the second section being adapted for receiving the parallel portions of the clamp when the clamp has been opened, such that the clamp will stay in an open position after the clamp has been opened.

10. Arrangement according to claim 9, wherein the second section has substantially parallel edges, such that the clamp will stay in an open position after the clamp has been opened.

11. A harness for carrying a hand-held motor-driven tool, the harness having at least one shoulder strap, and the harness comprising an arrangement for carrying a tool according to any one of claims 1 to 10.

PRIOR ART

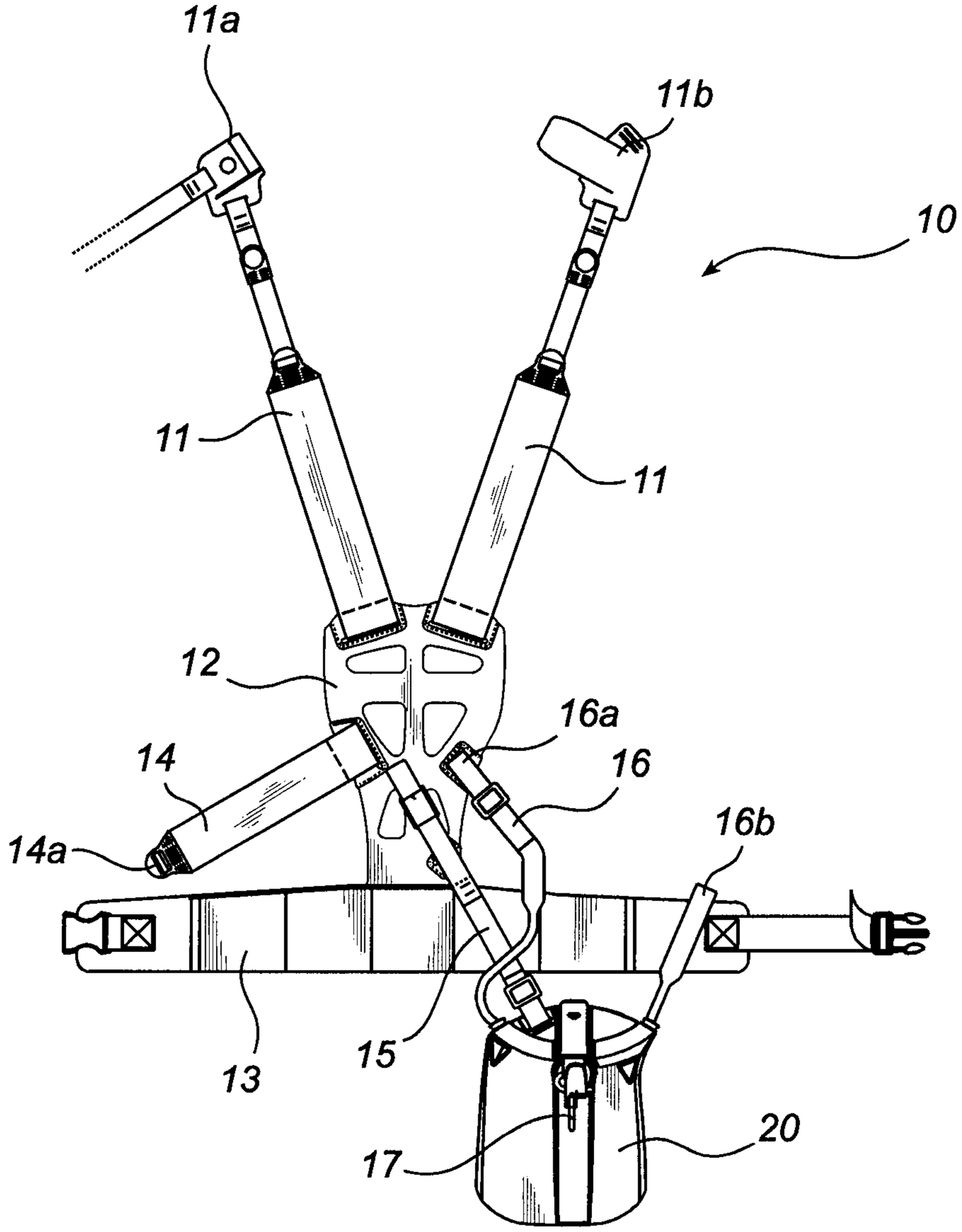


Fig. 1

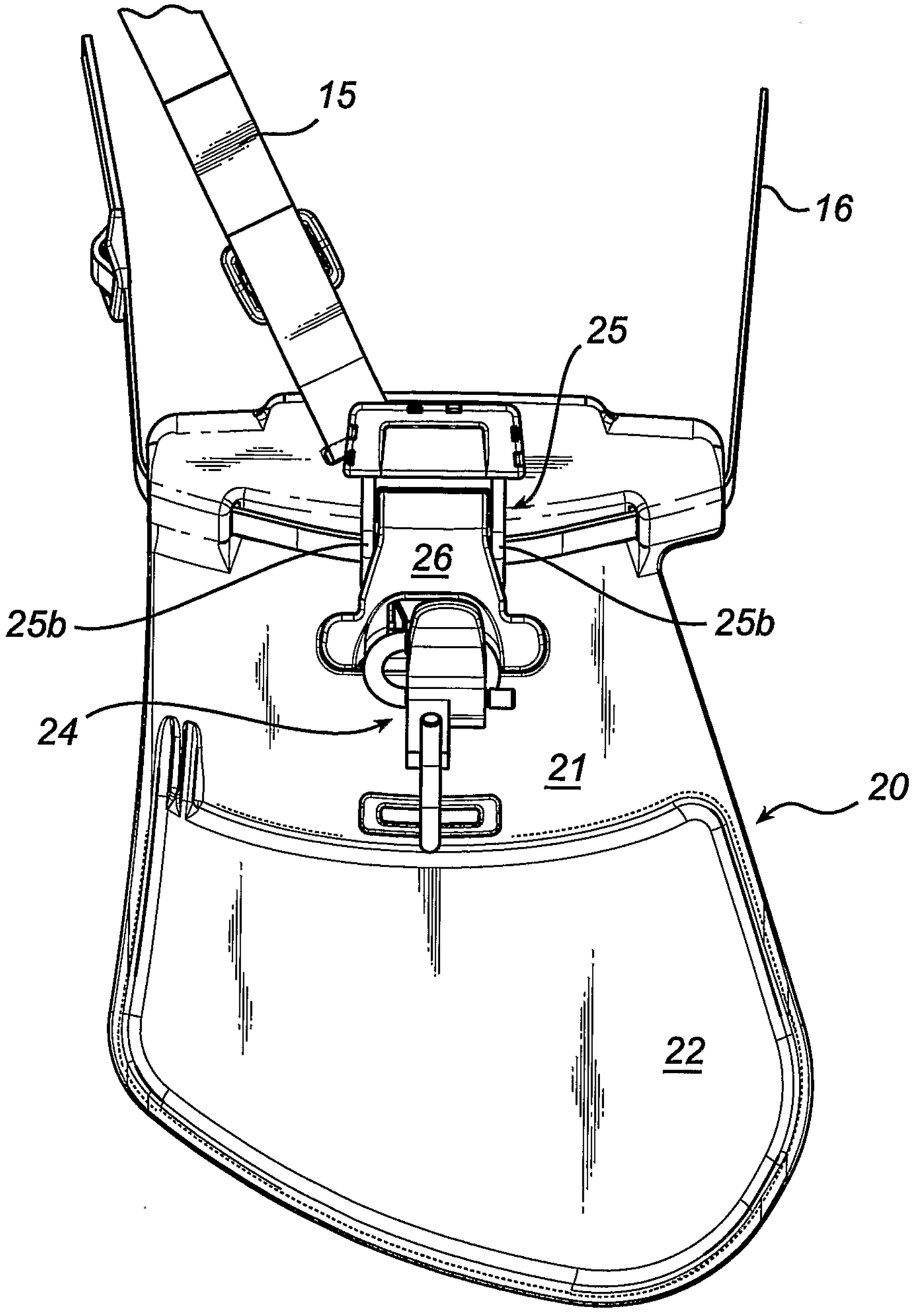


Fig. 2

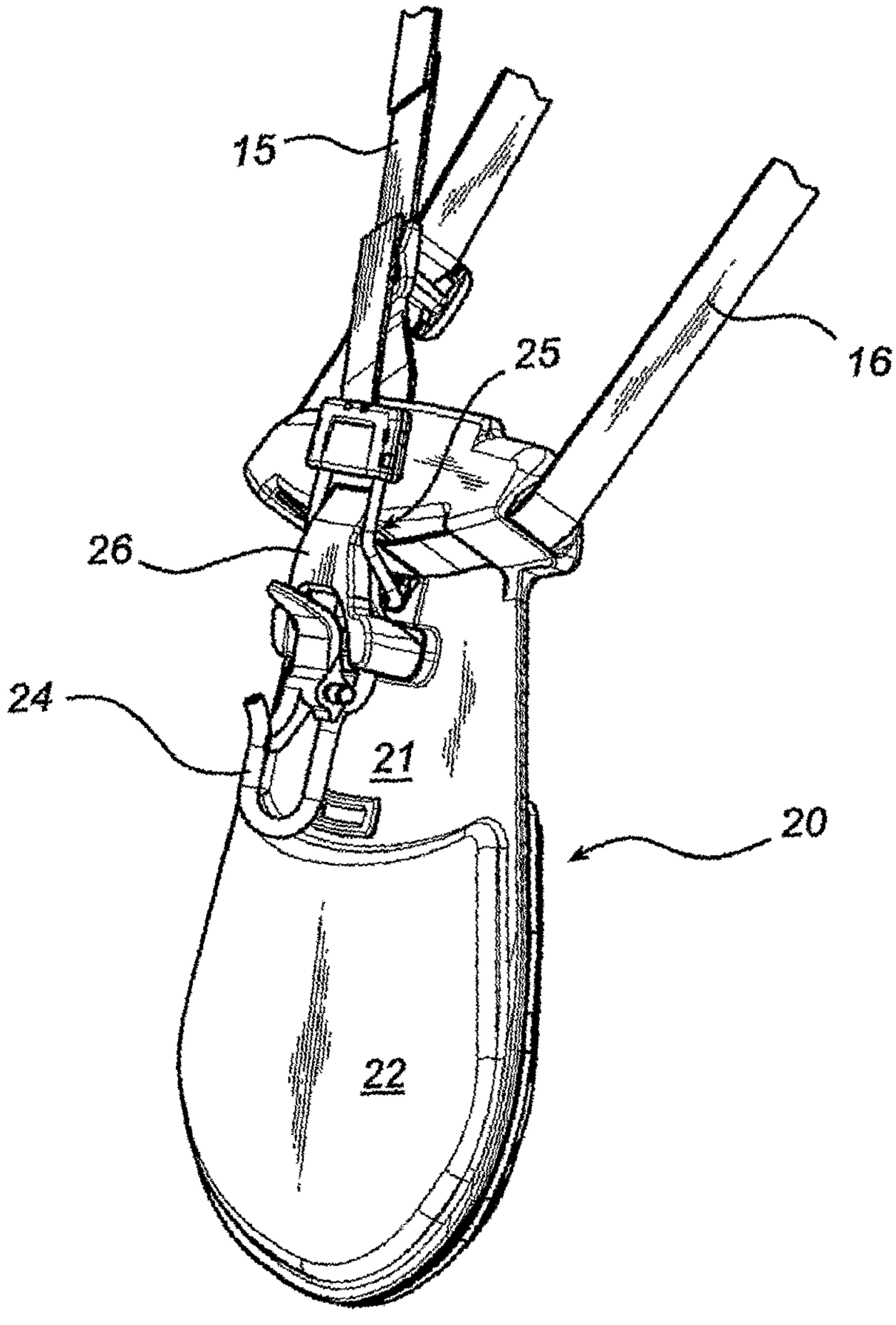


Fig. 3

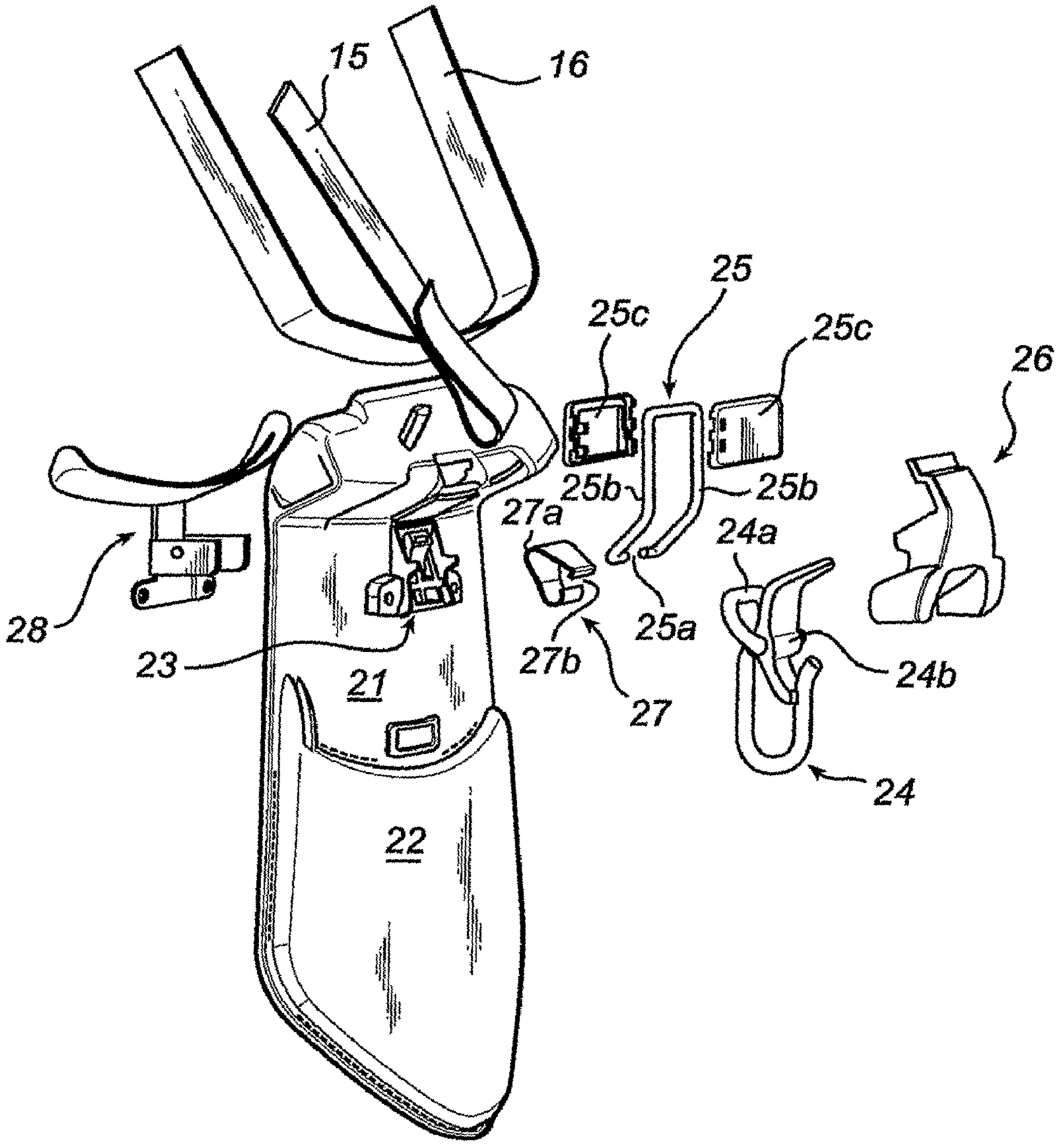


Fig. 4

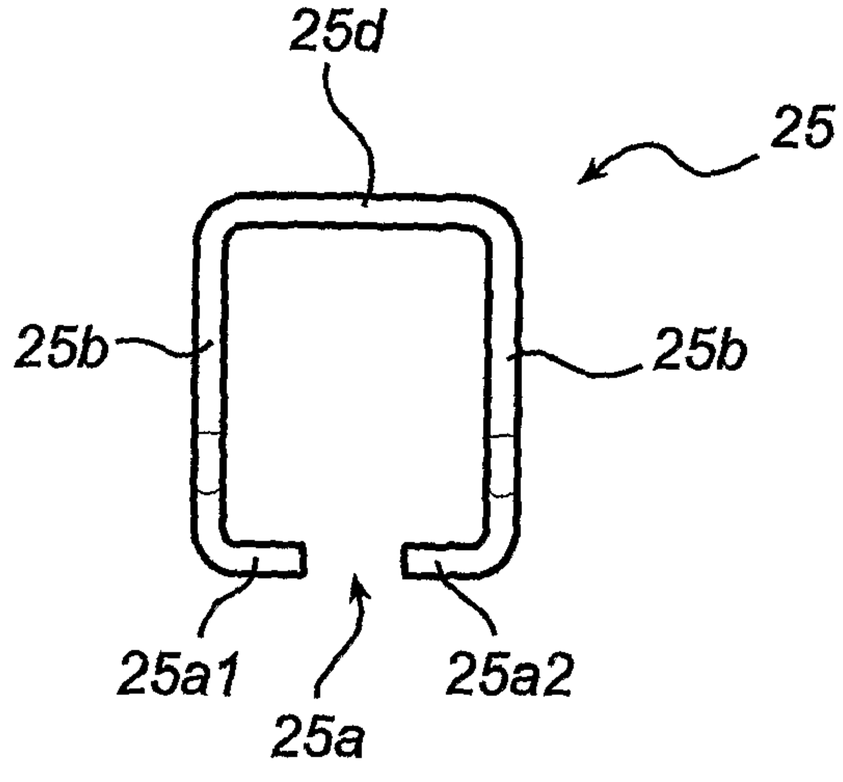


Fig. 5

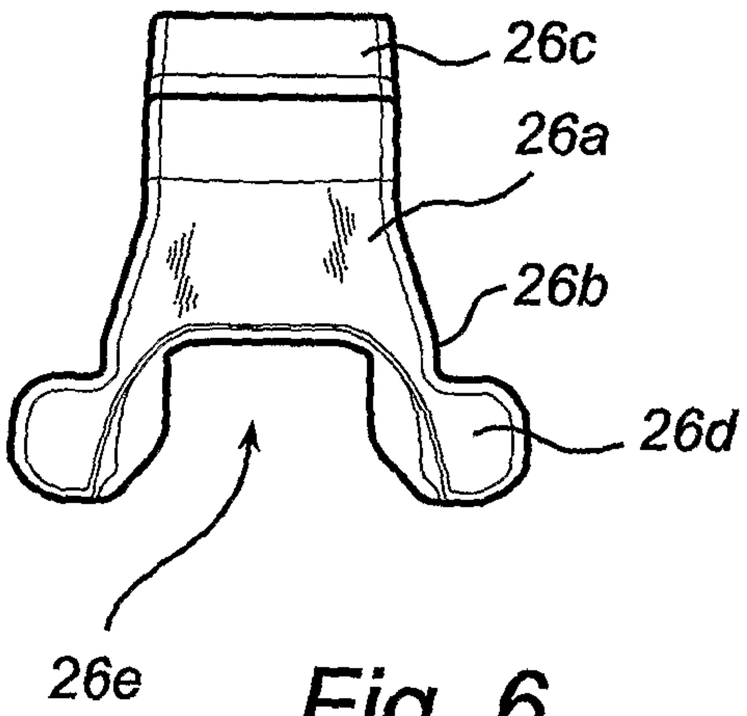
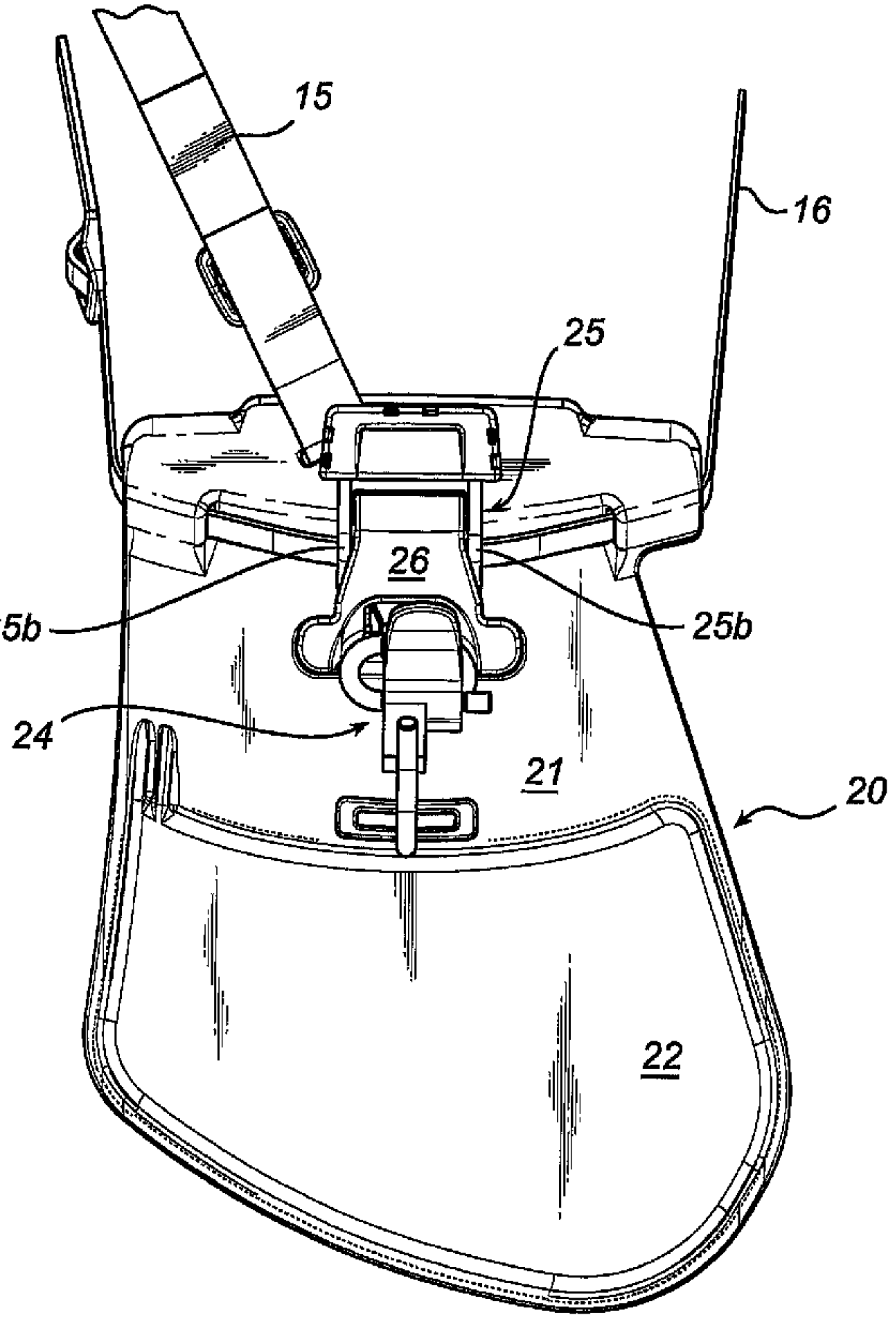


Fig. 6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