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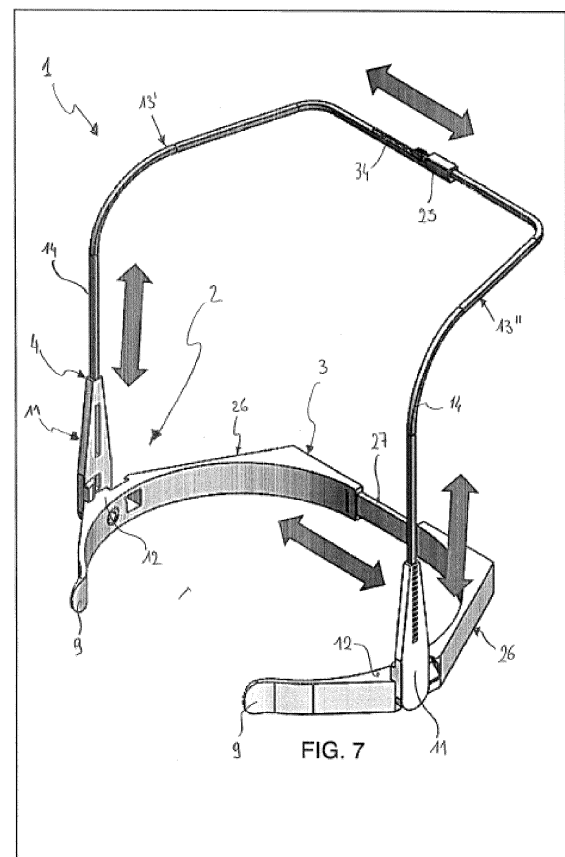
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Remarks:

A request for re-establishment of rights in respect of the twelve-month period from the date of filing of the first application has been granted (Art.87(1) and Art.122 EPC).

(54) **A DEVICE FOR A FACE COVERING**

(57) A device for face covering with a frame comprising a neck mounting arrangement configured to mount the same frame around/to a user's neck, the frame further comprising an arrangement for bearing a face cover. The face cover bearing arrangement being configured to be moved between at least one in use condition and at least one out of use condition wherein the face cover bearing arrangement is configured to move the face cover between an in use condition and an out of use condition and wherein the face cover bearing arrangement is configured to move relative to the neck mounting arrangement.



Description

[0001] The present invention relates to a device for face covering, in particular to be used as protective equipment for nose and/or mouth or, in general, the whole or part of the face.

[0002] Face coverings serve the purpose of protecting both the user and others from contact with droplets, splashes or sprays containing germs. The wearing of face coverings is usually required by medical professionals to protect themselves and patients from germ containing droplets. However, due to the COVID-19 pandemic, it also became necessary and commonplace to wear face coverings in other public places including shops, restaurants, public transport facilities and workplaces.

[0003] Current face coverings include face masks and face shields. Face masks typically comprise a cloth portion that covers the nose and mouth and elastic ear loops or ties to secure the masks around the back of the users' ears or head. Face shields typically comprise a band for securing the shield around the forehead and have a plastic face covering that extends from the forehead down past the chin of a user. Such face masks and face shields can be uncomfortable around the face, head and ears and are often incompatible with other features such as spectacles and certain hairstyles. It is typically not possible nor advisable for users to try on face coverings for fit before purchase as this can result in germs being spread between consumers. Therefore, if the face covering is too tight, these cannot be adjusted and the covering can cause skin irritation. In addition, face coverings result in a restricted air flow which can cause further discomfort and breathing difficulties for the user. It is therefore common for users of face coverings to frequently fidget with the covering or remove and reapply the face covering to the face. This means that any germs or contaminants on the users hands are being transferred to the face covering which subsequently increases the likelihood of the germs being inhaled by the user.

[0004] It is an object of the present invention to mitigate, at least partially, the problems associated with current face coverings, thus providing a device for face covering.

[0005] It is a further object of the present invention to prevent the transmission of germs due to hand contact with face coverings.

[0006] It is a further object of the present invention to provide adjustability for face coverings.

[0007] It is a further object of the present invention to provide a device for face covering that is comfortable to wear.

[0008] It is a further object of the present invention to provide a device for face covering that has an alternative and improved characterisation and design, in both constructional and functional terms, compared with the known solutions for face covering.

[0009] It is a further object of the present invention to provide a device that is easily and quickly adjustable

according to the needs of the specific application, even during use.

[0010] It is a further object of the present invention to provide a device for face covering of easy, quick and low-cost construction.

[0011] It is a further object of the present invention to provide a device that requires little maintenance and can be of a suitably robust construction and design.

[0012] Accordingly, all these objects, considered individually and in any combination thereof, are achieved according to the invention by a device for face covering with a frame comprising a neck mounting means configured to mount the same frame around/to a user's neck, the frame further comprising means for bearing a cover, said face cover bearing means being configured to be moved between at least one in use condition and at least one out of use condition.

[0013] By "in use condition" we mean at a condition wherein the bearing means supports the face cover in a position in front of the user's face and/or above the user's chin. Ideally, in the "in use condition" the bearing means supports the face cover in a position in front of the user's face so as to cover both the nose and mouth. Ideally, in the "in use condition" the bearing means supports the face cover so as to be in contact with the face skin.

[0014] By "out of use condition" we mean at a condition wherein the bearing means supports the face cover in a position below the user's chin and/or in front of the user's chest. Ideally, in the "out of use condition" the bearing means supports the face cover in a resting position below the face. Ideally, in the "out of use condition" the bearing means supports the face cover so as to be out of contact with the face skin.

[0015] Preferably, the face cover bearing means are configured to move the face cover between an in use condition and an out of use condition.

[0016] Preferably, the face cover bearing means is configured to move relative to the neck mounting means.

[0017] Preferably, the face cover bearing means is configured to move independently from the neck mounting means.

[0018] Advantageously, this means that the frame can remain mounted around/to a user's neck when the face cover bearing means is in an in use condition and/or when the face cover bearing means is in an out of use condition.

[0019] Preferably, the face cover bearing means is configurable to move between an in use condition and an out of use condition whilst the frame is mounted around/to a user's neck.

[0020] Preferably, the face cover bearing means is pivotable between an in use condition and an out of use condition.

[0021] Preferably, the face cover bearing means is pivotable relative to the neck mounting means.

[0022] Preferably, the face cover bearing means is rotatable between an in use condition and an out of use condition.

[0023] Preferably, the face cover bearing means is ro-

tatable relative to the neck mounting means.

[0024] Preferably, the face cover bearing means is configurable to pivot and/or rotate relative to the neck mounting means via any mechanical pivot and/or rotation means. Ideally, the mechanical pivot and/or rotation means comprise a bearing and/or joint.

[0025] Preferably, the device comprises actuation means to actuate movement of the face cover bearing means between an in use condition and an out of use condition. Preferably, the device comprises actuation means to actuate movement of the face cover bearing means between an out of use condition and an in use condition.

[0026] Preferably, the actuation means are mounted on the frame.

[0027] Preferably, the actuation means is mechanically operated. Preferably, the actuation means is spring operated. Preferably, the actuation means is electrically operated. Preferably, the actuation means is pneumatically operated.

[0028] Advantageously, the face covering bearing means are configured to be moved manually between an in use condition and an out of use condition.

[0029] Preferably, the neck mounting means is shaped, at least partially, to correspond to a neck. Preferably, the neck mounting means is shaped to be elastically mounted around the user's neck.

[0030] Ideally, the neck mounting means comprises a neck band. Ideally, the neck mounting means comprises a neck collar that is frontally open.

[0031] Ideally, the neck mounting means is configured to clamp the user's neck.

[0032] Preferably, the neck mounting means comprises a front portion and a back portion.

[0033] Preferably, the front portion and back portion are mutually opposing.

[0034] Ideally, when the frame is mounted, the front portion of the neck mounting means is adjacent to the front of the user's neck and the back portion of the neck mounting means is adjacent to the back of the user's neck.

[0035] Preferably, the neck mounting means comprises two mutually opposing lateral portions extending between the front portion and the back portion. Preferably, the back portion comprises at least one pad, thus increasing the comfort when wearing around the neck.

[0036] Preferably, the neck mounting means comprises two free end portions that are spaced apart from each other. Preferably, the neck mounting means is configured so that the two free end portions can be moved near or away from each other. Preferably, the neck mounting means comprises at least one elastic portion or is made of elastic material so that the two free end portions can be moved near or away from each other, thus allowing the neck mounting means to be placed around a user's neck.

[0037] Preferably, the neck mounting means comprises at least one malleable portion or is made of malleable

material.

[0038] Preferably, the back portion is open or is configurable to be opened so that the neck mounting means can be placed around a user's neck. Preferably, the front portion is open or is configurable to be opened so that the neck mounting means can be placed around a user's neck.

[0039] Preferably, the neck mounting means is C-shaped. Preferably, the neck mounting means is U-shaped.

[0040] Ideally, the neck mounting means is a C-shaped or U-shaped necklace to be worn around the user's neck.

[0041] Preferably, the face cover bearing means is connected or connectable to the neck mounting means.

[0042] Preferably, the face covering bearing means is connectable to the neck mounting means at the mutually opposing lateral portions of the neck mounting means.

[0043] Preferably, the face cover bearing means is configured to be removably connected to the neck mounting means. Preferably, the neck mounting means is configured to be removably connected to the face cover bearing means.

[0044] Preferably, the device comprises connection means for connecting the face cover bearing means to the neck mounting means.

[0045] Ideally, the device comprises at least one pivot joint, provided on the frame, for pivoting the face cover bearing means relative to the neck mounting means.

[0046] Preferably, the frame comprises two pivot joints, facing each other, for pivoting the face cover bearing means relative to the neck mounting means.

[0047] Preferably, said at least one pivot joint is configured so as to provide an haptic feedback for the pivoting movement of the face cover bearing means relative to the neck mounting means.

[0048] Preferably, said at least one pivot joint is configured to provides a snap pivoting of the face cover bearing means relative to the neck mounting means.

[0049] Preferably, the connection means comprises at least one connection member for connecting the face cover bearing means to the neck mounting means.

[0050] Ideally, the connection means comprises a plurality of connection members.

[0051] Preferably, the face cover bearing means comprises a connection member for connecting to the neck mounting means.

[0052] Preferably, the neck mounting means comprises a connection portion for connecting to the face cover bearing means.

[0053] Preferably, the face cover bearing means is configured to be connected to the neck mounting means via a mechanical fastener.

[0054] Preferably, the face cover bearing means comprises a connection member that is configured to be connected to the connection portion of the neck mounting means via a mechanical fastener.

[0055] Ideally, the face cover bearing means is connectable to the neck mounting means via a snap fit con-

nection.

[0056] Preferably, the face cover bearing means comprises a connection member that is configured to be connected to the connection portion of the neck mounting means via a snap fit portion.

[0057] Ideally, the face cover bearing means is connectable to the neck mounting means via an interference fit connection.

[0058] Preferably, the face cover bearing means comprises a connection member that is configured to be connected to the connection portion of the neck mounting means via an interference fit portion.

[0059] Preferably, the connection portions are defined on the lateral portions of the neck mounting means. Preferably, the connection portions are defined on the neck mounting means so as to face each other.

[0060] Preferably, the connection members of the face cover bearing means are mounted on the two lateral portions of the neck mounting means and are facing one another in use.

[0061] Preferably, the face cover bearing means is configured to pivot around an axis crossing both the two connection portions of the neck mounting means.

[0062] Preferably, the face cover bearing means is configured to rotate around an axis crossing both the two connection portions of the neck mounting means.

[0063] Advantageously, the face cover bearing means comprises a structure configured to be articulated to the neck mounting means and configured to support the face cover.

[0064] Preferably, the face cover bearing means comprises means for removably attaching a face cover. Thus allowing an easy change of the face cover for cleaning or fashion reasons.

[0065] Preferably, the means for attaching the face cover comprises fastening means, such as hook and loop fasteners, such as for example Velcro. Preferably, the face cover may be bonded or fastened to the structure of the face cover bearing means.

[0066] Preferably, the structure of the face cover bearing means comprises the two connection members for the connection to the connection portions of the neck mounting means, and further comprises at least one supporting member for sustaining the face cover.

[0067] Preferably, said at least supporting member comprises at least one wire frame. Preferably, the supporting member comprises a micro flexible wire. Preferably, the opposite ends of the wire frame are attached or attachable respectively to the two connection members. Preferably, the wire frame is fastened or fastenable to the correspondingly located connection member. Preferably, the wire frame is adjustably fastened or fastenable to the correspondingly located connection member. Preferably, the wire frame is made entirely or at least partially of elastic material. Preferably, the wire frame is made entirely or at least partially of malleable material.

[0068] Preferably, the face cover bearing means comprises two connection members, each of them is articu-

lated to one of the two connection portions of the neck mounting means. Preferably, each connection member has a first end fastened to one of the connection portions, while the other (second) end interacts with the other (second) end of the other member.

[0069] Preferably, each connection member comprises an arm having one end articulated to a corresponding connection portion of the neck mounting means.

[0070] Advantageously, the device comprises means for maintaining stably the arrangement of the face cover bearing means in respect to the neck mounting means. Preferably, the device comprises means for maintaining stably, at least when the bearing means are in at least one in use condition, the arrangement of the face cover bearing means in respect to the neck mounting means.

[0071] Preferably, the means for maintaining stably the arrangement of the face cover bearing means in respect to the neck mounting means comprises a movable interlocking engagement between elements, provided on or integral with the connection members, and counter-elements, provided on or integral with the connection portions.

[0072] Preferably, the means for maintaining stably the arrangement of the face cover bearing means in respect to the neck mounting means comprises a toothed profile that is provided on or is integral with the connection members and that interacts or is configured to interact with a counter-toothed profile provided on the connection portions of the neck mounting means.

[0073] Preferably, the connection members of the face cover bearing means comprise a toothed profile interacting or configured to interact with a counter-toothed profile provided on the connection portions of the neck mounting means, thus providing a stable arrangement of the bearing means in respect of the neck mounting means and/or providing snap articulation of the connection member to the connection portions.

[0074] Preferably, the means for connecting the face cover bearing means to the neck mounting means comprise a wheel. Preferably, the pivot joint for articulating the face covering means to the neck mounting means comprises a wheel. Preferably, the pivot joint comprises means for maintaining stably the arrangement of the face cover bearing means in respect to the neck mounting means.

[0075] Ideally, said wheel comprises a toothed profile interacting with a counter-toothed profile provided on the connection portions of the neck mounting means or on the connection member of the face cover bearing means.

[0076] Preferably, said wheel is integral in rotation with the connection member, while its toothed profile interacts with a corresponding counter-toothed profile provided on the connection portions of the neck mounting means. Ideally, the wheel is housed into a seat defined in the connection portion and then closed externally by the connection member that engages by interlocking with the connection portion so as to be articulated with respect to the latter.

[0077] Alternatively, said wheel is fastened to the connection portion of the neck mounting means, while its toothed profile interacts with a corresponding counter-toothed profile provided on the connection member of the face cover bearing means.

[0078] Advantageously, the device comprises means for increasing the torque at the pivot joint, in particular for increasing the force causing the rotation of the face cover bearing means in respect to the neck mounting means. Preferably, said means are configured to increase the force causing the rotation of the face cover bearing means in respect to the neck mounting means in order to shift from the out of use condition into the in use condition. Preferably, said means are configured to increase the lifting force causing the rotation of the face cover bearing means in respect to the neck mounting means so as to shift into the in use condition. Advantageously, this allows the lifting, once supported by the bearing means, of heavier face covers, as for example face covers such as scarfs or fabrics.

[0079] Preferably, said means for increasing the force causing the rotation of the bearing means in respect to the neck mounting means comprises at least one spring element. Ideally, said spring element comprises a coil spring. Preferably, the spring element is positioned and acts between the connection member of the bearing means and the connection portion of the neck mounting means so as to lift the bearing means and/or so as to push toward the in use condition.

[0080] Preferably, each arm of the connection member is provided with a seat for the insertion of a corresponding end of a supporting member. Preferably, said seat is configured so as to provide a snap engagement of a protrusion provided on a corresponding end of a supporting member, thus allowing the snap adjustment of the insertion of the supporting member into the corresponding arm.

[0081] Preferably, the face cover bearing means comprises two supporting members, each of them is fastened or fastenable to or into one of the two connection members. Preferably, each supporting member has a first end fastened or fastenable to or into one of the two connection members, while the other (second) end interacts with the other (second) end of the other supporting member.

[0082] Preferably, the second ends of the supporting members are configured to be mutually moved near or away.

[0083] Preferably, the first ends of the supporting members are configured to be adjustably inserted or insertable into the connection members, so as to vary the distance of the second ends of the supporting members from the neck mounting means.

[0084] Preferably, said supporting members are configured as wire extensions.

[0085] Ideally, said supporting members are configured as two corresponding wire extensions, each of them having a first section that is substantially parallel to the respective first section of the other extension, a second

section that interacts and/or is fastened - preferably in an adjustable way - with the respective second section of the other extension. Preferably, each extension comprises a curved/intermediate section, each of them is positioned between the first and the second section, and is configured/shaped so that the second section extends perpendicularly to the first section and towards the other/facing extension.

[0086] Preferably, said supporting members are configured to be reciprocally moved near or away by a snap adjustment.

[0087] Preferably, at the two free ends of the two supporting members is provided with a coupling or sleeve for housing at least one of said free ends. Ideally, the free ends are housed within the same coupling or sleeve in a slidable way. Preferably, said coupling or sleeve is integral with the free end of one of said two supporting member, while the free end of the other member slides within said coupling or sleeve. Preferably, teeth zones configured for interacting with each other are provided at both free ends of the supporting members, thus allowing a snap sliding of one member toward or away from the other.

[0088] Preferably, the frame is adjustable.

[0089] Preferably, the neck mounting means are adjustable. Ideally, the neck mounting means are width adjustable.

[0090] Preferably, the face cover bearing means are adjustable. Preferably, the face cover bearing means are width adjustable.

[0091] Preferably, the frame is configured so that the distance between the face cover bearing means and the neck mounting means is adjustable.

[0092] Ideally, the neck mounting means are made of two parts attached to each other so as to be mutually moved near or away. Preferably, the two parts are interconnected by an adjusting member. Preferably, said adjusting member is a tongue that is integral into one of the two part of the neck mounting means, while cooperates with the other part of the neck mounting means.

[0093] Preferably, the width of the frame is adjustable. Ideally, the frame is configured so as to move near or away the two end portions that are spaced apart to each other and/or to move near or away the two lateral portions.

[0094] Advantageously, this allows the frame to accommodate different face and neck sizes and comfort levels.

[0095] Advantageously, the frame is highly adjustable so that the user can wear the face cover (that is sustained by the face cover bearing means) looser, for example like a face shield, or tighter, for example like a medical mask.

[0096] Advantageously, when the bearing means are in the in use condition the connection members are substantially parallel or slightly angled in respect to the corresponding connection portions of the neck mounting means.

[0097] Advantageously, when the bearing means are in the out of use condition the connection members are angled, preferably of an angle greater than 30° or even more preferably of an angle of about 90°, in respect to the corresponding connection portions of the neck mounting means.

[0098] Advantageously, the device comprises activation means for activating the passage of the face cover bearing means from the in use condition to the out of use condition and/or from the out of use condition to the in use condition.

[0099] Preferably, the activation means comprises a trigger element. Preferably, the trigger element is activated externally. Preferably, the trigger element comprises a button, in particular a push-button. Preferably, the trigger element is mounted on the neck mounting means and cooperates with the face cover bearing means, in particular with at least one connection member of said face cover bearing means. Preferably, the trigger element comprises and/or is associated with an elastic segment that, when/once activated, moves from an angled condition to a straight condition, or from a more angled condition to a less angled condition.

[0100] Advantageously, the device comprises a locking mechanism so as to maintain the face cover bearing means in the in use condition. Preferably, said locking mechanism is a mechanical mechanism. Preferably, said locking mechanism is automatically activated when the face cover bearing means shifts from the out of use condition into the in use condition.

[0101] Advantageously, the device comprises a locking mechanism so as to maintain the face cover bearing means in the out of use condition. Preferably, said locking mechanism is a mechanical mechanism. Preferably, said locking mechanism is automatically activated when the face cover bearing means shifts from the in use condition into the out of use condition.

[0102] Preferably, the locking mechanism comprises a locking segment that is elastically activated. Preferably, the locking segment is mounted on the neck mounting means and cooperates with the face cover bearing means. Preferably, the locking means is mounted on the connection portion of the neck mounting means and cooperates with the connection member of the face cover bearing means.

[0103] Preferably, when the face cover bearing means is in the in use condition, the locking segment prevents the rotation of the bearing means so as to return in the out of use condition. Ideally, when the face cover bearing means is in the in use condition, the locking segment laterally abuts with an external side of the connection member so as to prevent the rotation of connection member toward the out of use condition. Preferably, the locking mechanism is configured so that - when the face cover bearing means is actuated manually or by the actuation means - such actuation wins the action of the locking segment, so that it does not prevent the rotation of the face cover bearing means into the out of use condition.

[0104] Preferably, when the face cover bearing means is in the out of use condition, the locking segment prevents the rotation of the bearing means so as to return in the in use condition. Ideally, when the face cover bearing means is in the out of use condition, the locking segment fits, at least partially, into a corresponding cavity so as to maintain the connection member in the out of use condition. Preferably, the locking mechanism is configured so that - when the face cover bearing means is actuated manually or by the actuation means - such actuation wins the action of the locking segment, so that it does not prevent the rotation of the face cover bearing means into the in use condition.

[0105] Preferably, the device comprises a release mechanism for shifting the face cover bearing means from the out of use condition into the in use condition. Preferably, said release mechanism is a mechanical mechanism. Preferably, said release mechanism is activated manually by the user without any direct contact or touch with the face cover.

[0106] Advantageously, the release mechanism is configured to load the spring element so as to then cause the rotation of the face cover bearing means into the in use condition.

[0107] Advantageously, the device comprises a release condition of the face cover bearing means for preparing/loading the shifting of the bearing means from the out of use condition into the in use condition. Preferably, in the release condition the face cover bearing means is rotated in a direction opposite to the one for passing from the out of use condition into the in use condition.

[0108] Preferably, the connection member is configured so as to deactivate the locking mechanism when the face cover bearing means is in the release condition. Preferably, the connection member comprises a shoulder that, during the release condition, interacts with the locking segment so as to push the latter out from the cavity of the connection member.

[0109] Advantageously, the frame is made of plastic material.

[0110] Preferably, the components/parts of the frame are made by injection moulding.

[0111] Preferably, the components/parts of the frame are made by 3D printing.

[0112] Preferably, the face cover bearing means are configured for attaching the face cover.

[0113] Preferably, the device further comprises a face cover.

[0114] Preferably, the face cover is removably attached to the face cover bearing means.

[0115] Preferably, the face cover is integral with the face cover bearing means.

[0116] Preferably, the face cover comprises a face mask.

[0117] Preferably, the face cover is a protective shield.

[0118] Preferably, the face cover is mouldable.

[0119] Preferably, the face cover is made of tissue.

[0120] Preferably, the face cover comprises or is en-

tirely made of an air filtration material.

[0121] Preferably, the face cover comprises at least an air filtration area.

[0122] Preferably, the face cover comprises an air filter module.

[0123] The skilled man will appreciate that all preferred or optional features of the invention described with reference to only some aspects or embodiments of the invention may be applied to all aspects of the invention.

[0124] It will be appreciated that optional features applicable to one aspect of the invention can be used in any combination, and in any number. Moreover, they can also be used with any of the other aspects of the invention in any combination and in any number. This includes, but is not limited to, the dependent claims from any claim being used as dependent claims for any other claim in the claims of this application.

[0125] The invention will now be described with reference to the accompanying drawings which show by way of example only one embodiment of a device in accordance with the invention.

[0126] In the drawings:

Figure 1 is a perspective view of the device according to the invention in the in use condition,

Figure 2 is a perspective view of the device of fig. 1 in the out of use condition,

Figure 3 is a perspective view of one of the two parts of the neck mounting means,

Figure 4 is a perspective view of the connection member of the face cover bearing means,

Figure 5 is a perspective view of the wheel of the connection means,

Figure 6a and 6b are respective views of the two supporting members of the face cover bearing means,

Figure 7 is a perspective view of the device according to the invention in the in use condition and showing the adjustment options,

Figure 8 is a perspective view of the pivot joint of the connection member of the face cover bearing means with the connection portion of the neck mounting means, wherein the connection portion is shown in transparency,

Figure 9 is a perspective view of the pivot joint of Fig. 8,

Figure 10 is a perspective view of the pivot joint of Fig. 8 in a partial section,

Figure 11 is a perspective view of the pivot joint - when the face cover bearing means is in the in use condition - of the connection member of the face cover bearing means with the connection portion of the neck mounting means, wherein the connection member is shown in transparency,

Figure 12 is a perspective view of the pivot joint - when the face cover bearing means is in the out of use condition - of the connection member of the face cover bearing means with the connection portion of

the neck mounting means, wherein the connection member is shown in transparency,

Figure 12a is a detailed view of Fig. 12 in a different perspective view,

Figure 13 is a perspective view of the pivot joint - when the face cover bearing means is in the release condition - of the connection member of the face cover bearing means with the connection portion of the neck mounting means, wherein the connection member is shown in transparency,

Figure 13a is a detailed view of Fig. 13 in a different perspective view,

Figure 14 is a perspective view of a device according to the invention in its in use condition and worn by a user,

Figure 15 is a different perspective view of the device of Figure 14 in its in use condition and worn by a user, Figure 16 is a perspective view of the device of Figure 14 in its out of use condition and worn by a user,

Figure 17 is a different perspective view of the device of Figure 14 in its out of use condition and worn by a user,

Figure 18 is a perspective view of the device according to the invention in its out of use condition,

Figure 19 is a perspective view of the device of Figure 18 with a wire as supporting member,

Figure 20 is a perspective view of the pivot joint of the device of Figure 18 with the corresponding activation means,

Figure 21 is a different perspective view of the pivot joint of Figure 20.

[0127] Referring to the figures, there is shown a device indicated generally by the reference numeral 1 for a face covering according to the invention, said device 1 having a frame 2 having:

- a neck mounting arrangement 3 configured to mount the frame around/to a user's neck, and
- a face cover bearing arrangement 4 for sustaining a face cover 5.

[0128] The face cover bearing arrangement 4 is configured to be moved between at least one in use condition (see Figure 1) and at least one out of use condition (see Figure 2).

[0129] By "in use condition" we mean at a condition wherein the bearing arrangement 4 supports the face cover 5 in a position in front of the user's face and/or above the user's chin. In the "in use condition" the bearing arrangement 4 supports the face cover 5 in a position in front of the user's face so as to cover the nose and/or mouth. In the "in use condition" the bearing arrangement 4 supports the face cover 5 so as to be in contact with at least part of the skin of the face.

[0130] By "out of use condition" we mean at a condition wherein the bearing arrangement 4 supports the face

cover 5 in a position below the user's chin and/or in front of the user's chest. In the "out of use condition" the bearing arrangement 4 supports the face cover 5 in a resting position below the face, in particular away from the nose and/or mouth. Ideally, in the "out of use condition" the bearing arrangement 4 supports the face cover so as to be out of contact with the face skin.

[0131] The face cover bearing arrangement 4 is configured to move the face cover 5 between an in use condition and an out of use condition. The face cover bearing arrangement 4 is configured to move relative and independently from the neck mounting arrangement 3. This means that the frame 2 can remain mounted around/to a user's neck when the face cover bearing arrangement 4 is in an in use condition and/or when the face cover bearing arrangement 4 is in an out of use condition. The face cover bearing arrangement 4 is configurable to move between an in use condition and an out of use condition whilst the frame 2 is mounted around/to a user's neck. The face cover bearing arrangement 4 is pivotable relative to the neck mounting means 3 between an in use condition and an out of use condition. The face cover bearing arrangement 4 is configurable to pivot and/or rotate relative to the neck mounting arrangement 3 via any mechanical pivot and/or rotation arrangement. The device 1 has an actuation arrangement to actuate movement of the face cover bearing arrangement 4 between an in use condition and an out of use condition. The actuation arrangement is mounted on the frame. Preferably, the actuation arrangement may be mechanically operated, for example spring operated. The actuation arrangement may be electrically or pneumatically operated. The face covering bearing arrangement 4 is configured to be moved manually between an in use condition and an out of use condition.

[0132] The neck mounting arrangement 3 is shaped, at least partially, to correspond to a neck. The neck mounting arrangement 3 is shaped to be elastically mounted around the user's neck. The neck mounting arrangement 3 has a neck band. The neck mounting arrangement 3 has a front portion 6 and a back portion 7 that are mutually opposing. When the frame is mounted on a person, the front portion 6 of the neck mounting arrangement 3 is adjacent to the front of the user's neck and the back portion 7 of the neck mounting arrangement 3 is adjacent to the back of the user's neck. The neck mounting arrangement 3 has two mutually opposing lateral portions 8 extending between the front portion 6 and the back portion 7. The front and/or back portion has at least one pad, thus increasing the comfort when wearing around the neck. The neck mounting arrangement 3 comprises two free end portions 9 that are spaced apart from each other. The neck mounting arrangement 3 is configured so that the two free end portions 9 can be moved near or away from each other. The back portion 7 (see embodiment of Fig. 1 and 2) is open or is configurable to be opened so that the neck mounting arrangement can be placed around a user's neck. Alternatively, the

front portion 6 (see embodiment of Fig. 14-17) is open or is configurable to be opened so that the neck mounting arrangement can be placed around a user's neck. The neck mounting arrangement 3 is C-shaped or U-shaped.

5 The face covering bearing arrangement 4 is connectable to the neck mounting arrangement 3 at the mutually opposing lateral portions 8 of the neck mounting arrangement 3. The frame 2 comprises two pivot joints 10, facing each other, for pivoting the bearing arrangement 4 to the neck mounting arrangement 3. Said at least one pivot joint 10 is configured so as to provide haptic feedback for the snap pivoting movement of the face cover bearing arrangement 4 to the neck mounting arrangement 3. The face cover bearing arrangement 4 comprises two connection members 11 for connecting to corresponding connection portions 12 defined on the neck mounting arrangement 3. The two connection members 11 are configured to rotate around an axis extending between the two connection portions 12 of the neck mounting means 3. The face cover bearing arrangement 4 has a structure configured to be articulated to the neck mounting arrangement 3 and configured to support the face cover 5.

[0133] The face cover bearing arrangement 4 has means for removably attaching the face cover, thus allowing an easy change of the face cover for cleaning or for fashion reasons. The means for attaching the face cover has fastening means, such as hook and loop fasteners, such as for example Velcro®. The structure of the face cover bearing arrangement 4 has the two connection members 11 for connection to the connection portions 12 of the neck mounting arrangement 3, and further has at least one supporting member 13 for sustaining the face cover 5. Said at least supporting member 13 has at least one wire frame 14. The opposite ends of the wire frame 14 are attached or attachable respectively to the two connection members 11. Each connection member 11 has an arm 15 having one end articulated to a corresponding connection portion 12 of the neck mounting arrangement 3. The pivot joint 10 for connecting the face cover bearing arrangement 4 to the neck mounting arrangement 3 has a wheel 16. Said wheel 16 has a toothed profile 17 interacting with a counter-toothed profile 18 provided on the respective connection portion 12 of the neck mounting arrangement 3. The wheel 16 is housed into a seat defined in the connection portion 12 see Figure 3 and then closed externally by the connection member 13 see Figure 10 that engages by interlocking with the connection portion 12 so as to be articulated with respect to the latter. The device has means for increasing the torque at the pivot joint 10, in particular for increasing the force causing the rotation of the face cover bearing arrangement 4 in respect to the neck mounting arrangement 3. Said means for increasing the force causing the rotation of the bearing arrangement 4 in respect to the neck mounting arrangement 3 has at least one spring element 19, such as a coil spring, that is positioned and acts between the connection member 11 and the connection portion 12 so as to lift the bearing arrangement 4 and/or so as to push it

towards the in use condition. Each arm 15 of the connection member 11 is provided with a seat for the insertion of a corresponding end of a supporting member 13. Said seat is configured so as to provide a snap engagement of a protrusion provided on a corresponding end of a supporting member 13, thus allowing the snap fit engagement of the insertion of the supporting member into the corresponding arm 15.

[0134] The face cover bearing arrangement 4 has two supporting members 13' and 13'', each of them is fastened or fastenable to or into one of the two connection members 11. Each supporting member 13' (or 13'') has a first end 20 fastened or fastenable to or into one of the two connection members 11, while the other (second) end 21 interacts with the other (second) end of the other supporting member 13'' (or 13'). The second ends 21 of the two supporting members 13 are configured to be reciprocally moved near or away. The first end 20 of each of the two supporting members 13 is configured to be adjustably inserted or insertable into a corresponding connection member 11, so as to vary the distance of the second ends 21 of the two supporting members from the neck mounting arrangement 3. Said supporting members 13 may be configured as wire extensions. In particular, each wire extension has a first section 22 that is substantially parallel the respective first section of the other extension, a second section 23 that interacts and/or is fastened - in an adjustable way - with the respective second section of the other extension. Each extension has a curved/intermediate section 24, each of them is positioned between the first and the second section, and is configured/shaped so that the second section extends perpendicularly to the first section and towards the other/facing extension. At the two free ends (i.e. the second ends 21) of the two supporting members 13 is provided a coupling or sleeve 25 for housing at least one of said free ends. Said coupling or sleeve 25 is integral with the free end 21 of one of said two supporting member 13, while the free end of the other member 13 slides within said coupling or sleeve 25, thus adjusting the reciprocal width/distance of the two supporting members 13. Teeth zones 34 configured for interacting with each other are provided at both free ends 21 of the supporting members 13, thus allowing a snap sliding of one member toward or away from the other.

[0135] The neck mounting arrangement 3 are made of two parts 26 attached to each other so as to be mutually moved near or away. The two parts are interconnected by an adjusting member 26. The width of the frame is adjustable, thus allowing the frame to accommodate different face and neck sizes and comfort levels. The frame is highly adjustable so that the user can wear the face cover (that is sustained by the face cover bearing means) looser, for example like a face shield, or tighter, for example like a medical mask. When the bearing arrangement 4 is in the out of use condition the connection members 11 are substantially parallel or slightly angled in respect to the corresponding connection portions 12 of the

neck mounting arrangement 3. When the bearing means 4 are in the in use condition the connection members 11 are angled, preferably of an angle greater than 30° or even more preferably of an angle of about 90°, in respect to the corresponding connection portions 12 of the neck mounting arrangement 3. The device 1 comprises activation arrangement for activating the passage of the face cover bearing means from the in use condition to the out of use condition and/or from the out of use condition to the in use condition. The activation arrangement has a trigger element. The trigger element is activated externally. In one embodiment, the trigger element has a button, in particular a push-button 28. The device has a locking mechanism 29 so as to maintain the face cover bearing arrangement 4 in the in use condition or in the out of use condition. The locking mechanism 29 has a locking segment 30 that is elastically activated. The locking segment 30 is mounted on the connection portion 12 of the neck mounting arrangement 3 and cooperates with a corresponding locking formation on the connection member 11 of the face cover bearing arrangement 4.

[0136] When the face cover bearing arrangement 4 is in the out of use condition, the locking segment 30 prevents the rotation of the bearing arrangement 4 so as to prevent it from returning to the in use condition see Figure 12. When the face cover bearing arrangement 4 is in the out of use condition, the locking segment 30 laterally abuts with a corresponding locking formation on an external side of the connection member 11 so as to prevent the rotation of connection member 11 toward the in use condition. When the face cover bearing arrangement is in the out of use condition, the locking segment 30 prevents the rotation of the bearing arrangement 4 from returning to the in use condition. When the face cover bearing arrangement 4 is in the out of use condition, the locking segment 30 fits, at least partially, into a corresponding cavity 31 so as to maintain the connection member 11 in the out of use condition.

[0137] The device has a release mechanism 32 for shifting the face cover bearing arrangement 4 from the out of use condition into the in use condition. Said release mechanism 32 is activated manually by the user without any direct contact or touch with the face cover. The release mechanism 32 is configured to load the spring element 19 of the pivot joint 10 so as to then cause rotation of the face cover bearing arrangement 4 into the in use condition. The device has a release condition (see fig. 12) of the face cover bearing arrangement 4 for preparing the shifting of the bearing arrangement 4 from the out of use condition into the in use condition. In the release condition the face cover bearing arrangement 4 (see Fig. 13) is rotated in a direction opposite to the one for passing from the out of use condition (see Fig. 12) into the in use condition (see Fig. 11).

[0138] The connection member 11 has a shoulder 33 that, during the release condition, interacts with the locking segment 30 so as to push the latter out from the cavity 31 of the connection member 11. The frame 2 is made

of plastic material. The components/parts of the frame 2 (i.e. of the neck mounting means 3 and/or of the face cover bearing means 4) are made by injection moulding and/or by 3D printing.

[0139] The device 1 may further comprise a face cover 5. The face cover 5 may be removably attached to the face cover bearing arrangement 4 and/or may be integral with the face cover bearing arrangement 4. The face cover 5 has a face mask or a protective shield. The face cover 5 is made of tissue. The face cover 5 has or is entirely made of an air filtration material. The face cover 5 has at least an air filtration area or an air filter module. The face cover bearing arrangement is configurable to support a surgical mask.

[0140] From the above disclosure, the advantages of the device according to this invention are apparent, since by providing a device for the face covering that it can be easily worn, adjusted and, in general, used, while is simple and less costly to manufacture and assembled. More in detail, the device according to the invention is fully, quickly and easily adjustable, thus being suitable to be used in many different conditions, by avoiding a direct contact of the hands with the face cover/mask that is intended to be in contact with the skin and to cover the nose and mouth of the user.

[0141] Advantageously, the device allows to protect the user's face while it may be seamlessly stored around the user's neck when not in use, thus reducing the items in pocket or the user rifling through the pocket. Moreover, the device allows to hold the mask off the user's face, thus reducing heat build up.

[0142] Advantageously, the device allows to avoid or reduce the hand contact with the face or face cover/mask.

[0143] Conveniently, the device according to the invention may be used in several different applications for protecting the respiratory tract from germs, virus and bacteria, such as in the surgical and medical fields or in the daily life during the Covid pandemic. Moreover, conveniently, the device according to the invention may be used for protecting the face from debris or cold, but also for fashion trend.

[0144] In relation to the detailed description of the different embodiments of the invention, it will be understood that one or more technical features of one embodiment can be used in combination with one or more technical features of any other embodiment where the transferred use of the one or more technical features would be immediately apparent to a person of ordinary skill in the art to carry out a similar function in a similar way on the other embodiment.

[0145] In the preceding discussion of the invention, unless stated to the contrary, the disclosure of alternative values for the upper or lower limit of the permitted range of a parameter, coupled with an indication that one of the said values is more highly preferred than the other, is to be construed as an implied statement that each intermediate value of said parameter, lying between the more preferred and the less preferred of said alternatives, is

itself preferred to said less preferred value and also to each value lying between said less preferred value and said intermediate value.

[0146] The features disclosed in the foregoing description or the following drawings, expressed in their specific forms or in terms of a means for performing a disclosed function, or a method or a process of attaining the disclosed result, as appropriate, may separately, or in any combination of such features be utilised for realising the invention in diverse forms thereof as defined in the foregoing description and/or appended claims.

Claims

1. A device for face covering with a frame comprising a neck mounting means configured to mount the same frame around/to a user's neck, the frame further comprising means for bearing a face cover, said face cover bearing means being configured to be moved between at least one in use condition and at least one out of use condition.
2. A device as claimed in claim 1, wherein the face cover bearing means are configured to move the face cover between an in use condition and an out of use condition.
3. A device as claimed in claim 1 or claim 2, wherein the face cover bearing means is configured to move relative to the neck mounting means.
4. A device as claimed in any preceding claim, wherein the face cover bearing means is configured to move independently from the neck mounting means.
5. A device as claimed in any preceding claim, wherein the face cover bearing means is configurable to pivot and/or rotate relative to the neck mounting means via any mechanical pivot and/or rotation means.
6. A device as claimed in any preceding claim, wherein the device comprises actuation means to actuate movement of the face cover bearing means between an in use condition and an out of use condition.
7. A device as claimed in any preceding claim, wherein the actuation means are mounted on the frame and are operated by one of or any combination of mechanical, electrical, electronic or pneumatic means.
8. A device as claimed in any preceding claim, wherein the neck mounting means is shaped, at least partially, to correspond to a neck.
9. A device as claimed in any preceding claim, wherein the frame is with adjustable to accommodate variable neck and head size.

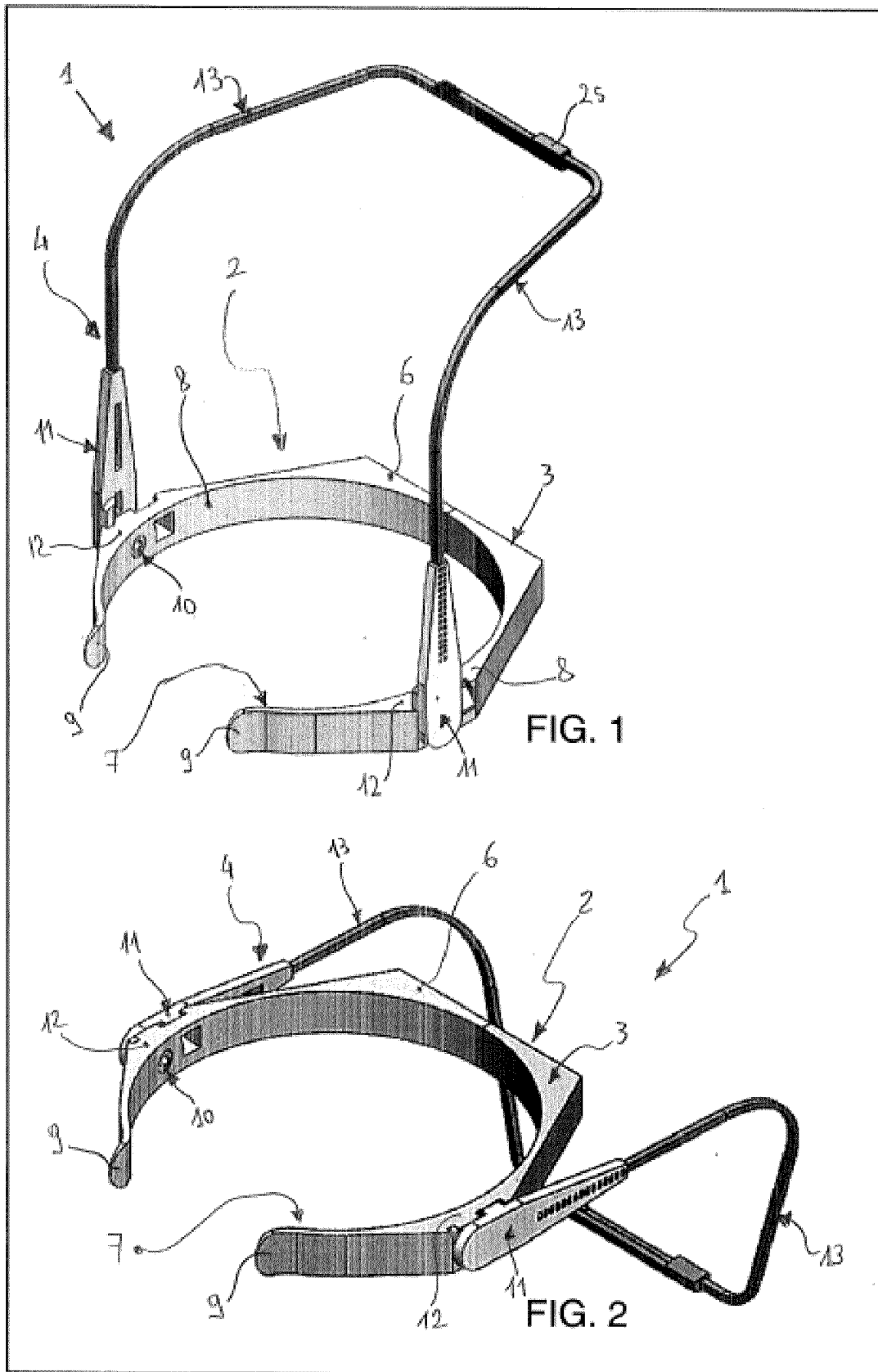
10. A device as claimed in any preceding claim, wherein the device comprises a brake means for releasably holding the face cover bearing means in the out of use condition and/or in the in use condition. 5
11. A device as claimed in any preceding claim, wherein the device comprises biasing means for normally biasing the face cover bearing means into the in use condition. 10
12. A device as claimed in claim 11 when dependent on claim 5, wherein the mechanical pivot and/or mechanical rotation means comprises biasing means for normally biasing the face cover bearing means into the in use condition. 15
13. A device as claimed in any preceding claim, wherein the device comprises means for releasably fixing the face cover bearing means at a plurality of positions between the in use condition and the out of use condition. 20
14. A device as claimed in claim 13 when dependent on claim 5, wherein the mechanical pivot and/or mechanical rotation means comprises means for releasably fixing the face cover bearing means at a plurality of angular positions relative to the neck mounting means between the in use condition and the out of use condition. 25 30
15. A device as claimed in any preceding claim, wherein the device comprises activation means for activating the passage of the face cover bearing means from the in use condition to the out of use condition and/or from the out of use condition to the in use condition, the activation means comprises a trigger element. 35

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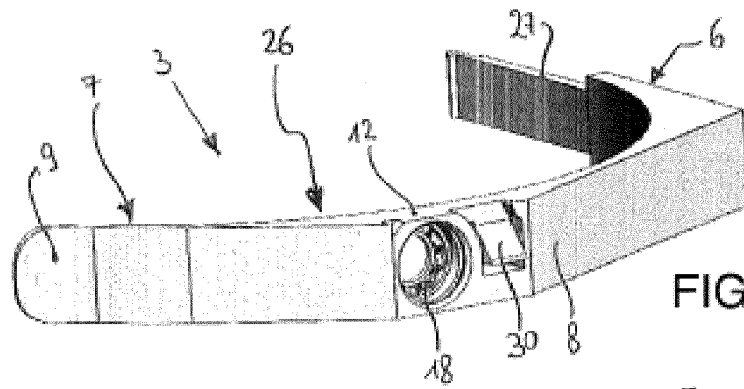


FIG. 3

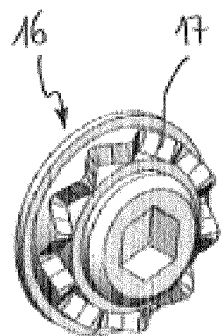


FIG. 5

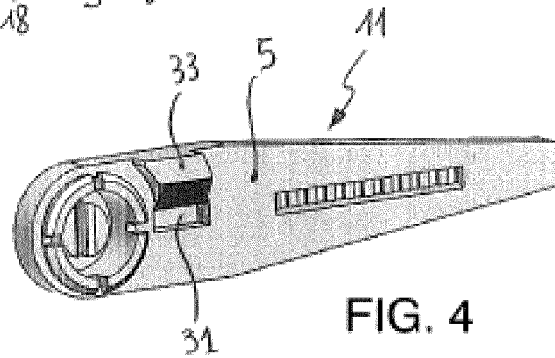


FIG. 4

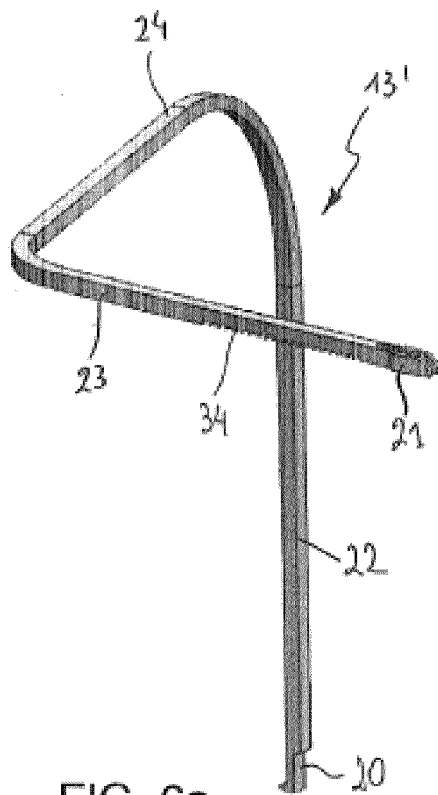


FIG. 6a

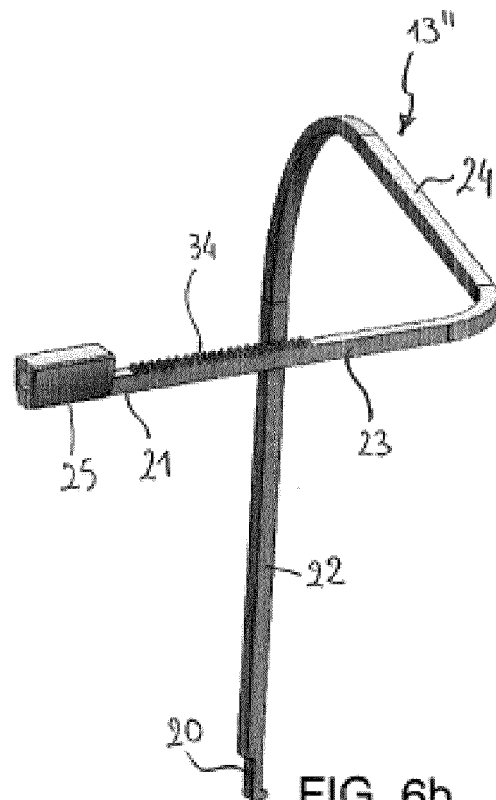


FIG. 6b

