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(54) **METHOD AND APPARATUS FOR THE ASSEMLY OF SAIL EYELETS AND IMPROVED SAIL EYELET**

(57) A method for the assembly of a sail eyelet (1, 1A) on a flap of flexible material (2) at a perforated seat (8) provided in the material, wherein the sail eyelet (1, 1A) comprises an eyelet (3, 3A) provided with a first hole and a washer (4, 4A) provided with a second hole, the first hole, the second hole and the perforated seat being, in the condition in which the sail eyelet (1, 1A) is assembled on the flap (2), substantially concentric, with the flexible material (2) interposed at least partly between the eyelet (3, 3A) and the washer (4, 4A), and wherein assembly is carried out by means of a press (10, 10', 10") which is adapted to cause a plastic deformation at least of part of the eyelet (3, 3A) in order to result in the anchoring thereof on the washer (4, 4A); the assembly method further comprises a step of retention of the flap of flexible material (2) in position, which is obtained by temporarily inserting an abutment element (11, 11', 11") of the press (10, 10', 10") into the perforated seat (8), at least in the condition in which the eyelet (3, 3A) is not anchored to the washer (4, 4A); other objects of the invention are an apparatus for the assembly of such sail eyelets and an improved sail eyelet.

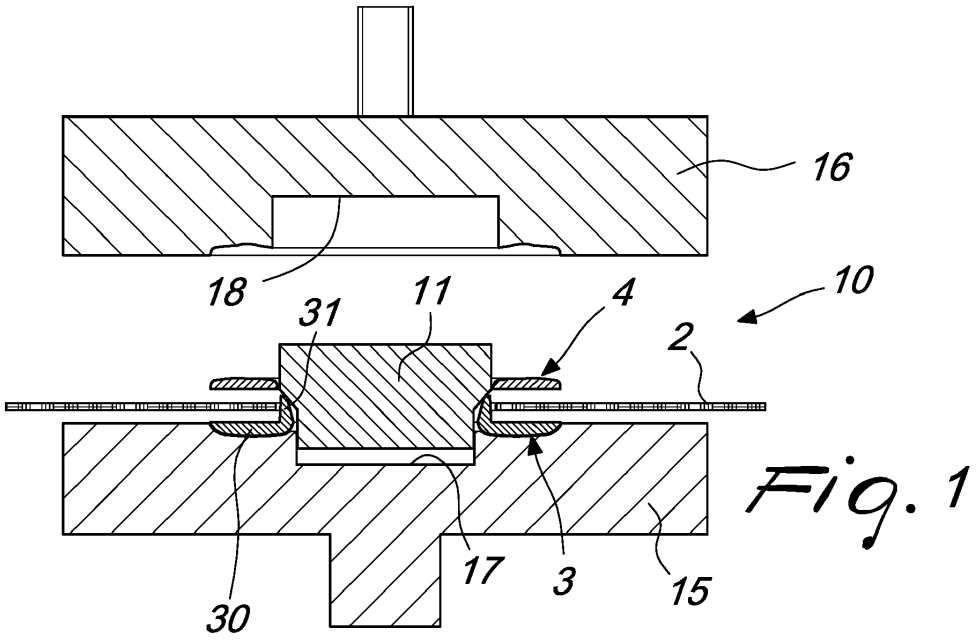

Fig. 1

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Description

[0001] The present invention relates to a method and a corresponding apparatus for the assembly of sail eyelets; in a related aspect the invention further relates to an improved sail eyelet.

[0002] Sail eyelets are generally known and widely used in fields such as maritime (where they were invented), clothing and clothing accessories, in the leather goods sector and the like.

[0003] Very generally, sail eyelets are made up of an eyelet part and a washer, both perforated, which are applied at a perforated seat provided on a flap of a flexible material (e.g. fabric, leather, plastic and the like), so as to cover the edges of the perforated seat and reinforce them.

[0004] Sail eyelets are usually made of brass for its good malleability.

[0005] In the manufacturing process, in fact, the eyelet part has a deep-drawn portion (which extends axially) over which the perforated seat of the flap is first fitted and then the washer, so that the flap is interposed between the eyelet and the washer, with the holes of these two parts and the perforated seat substantially mutually concentric. Then, at the assembly stage, a press (usually a special eyelet press) generates a plastic deformation of the deep-drawn portion which is folded around the washer, thus rendering the two mutually integral and stably retaining the flap of flexible material in position.

[0006] The axial length (or extension) of the deep-drawn portion of the eyelet is particularly important for two separate reasons: firstly it determines the stability of the anchoring, because it affects the length of the fold that constitutes the undercut through which the washer and eyelet are anchored; secondly, and perhaps more importantly, during assembly in the press, the deep-drawn portion of the eyelet is inserted into the perforated seat of the flap and retains it radially in position, ensuring that the sail eyelet is correctly applied.

[0007] It can thus be seen that the deep-drawn portion of the eyelet plays a critical role both at the manufacturing stage and in the assembled sail eyelet; in particular the axial length of the deep-drawn portion is a determining factor, since in fact below a certain length (variable as a function of the size of the eyelet proper and of the type and thickness of the flap) the effects of the deep-drawn portion would be canceled out.

[0008] Over time, this has prevented the use of materials other than brass to provide the eyelet and the washer: although different materials have in fact been tried as a substitute for it, their poor malleability has prevented their adoption; the deep-drawn portion would have had, in these cases, reduced axial extension in order to permit its plastic deformation without breaking, but this would have entailed problems both at the manufacturing stage and over the life of the sail eyelet.

[0009] Besides, even brass is not without its drawbacks, in the sense that apart from a relatively high cost, it has drawbacks associated with its ready availability and with the resulting productivity limitations if demand is high, especially when sail eyelets are required in high volumes and with particular characteristics (e.g. glossy and shiny surface finish).

[0010] The aim of the present invention consists of providing a method and a corresponding apparatus for the assembly of sail eyelets that solve the above technical problem, eliminate the drawbacks and overcome the limitations of the known art while also making it possible to use materials other than brass, while not compromising the manufacturing or the strength of the sail eyelets proper.

[0011] Within this aim, an object of the present invention is to provide a method and a corresponding apparatus for the assembly of sail eyelets that make it possible, if brass is used as the material for the eyelet, to save on the brass by reducing the quantity thereof necessary per individual sail eyelet.

[0012] Another object of the invention consists of providing an improved sail eyelet that is low cost, easily sourced and can substitute brass without compromising the characteristics required to sail eyelets.

[0013] Another object of the invention consists of providing an improved sail eyelet that is easy to implement and economically competitive when compared to the known art.

[0014] This aim and these and other objects which will become better apparent hereinafter are achieved by a method for the assembly of an eyelet which comprises a step of retention of the flap of flexible material in position, which is obtained by temporarily inserting an abutment element of the press into the perforated seat, in the condition in which the eyelet is not anchored to the washer.

[0015] As a consequence, another object of the invention is to provide an apparatus for the assembly of sail eyelets according to the corresponding enclosed independent claim.

[0016] In a related aspect, another object of the invention is furthermore to provide an improved sail eyelet according to the corresponding enclosed independent claim.

[0017] The dependent claims refer to optional characteristics of the invention and are understood to be an integral part of the present description.

[0018] Further characteristics and advantages of the invention will become better apparent from the description of some preferred, but not exclusive, embodiments of the invention which are illustrated by way of non-limiting example with the aid of the accompanying drawings wherein:

Figures 1-3 are cross-sectional schematic views at different times and a view of a detail of part of a first embodiment of an apparatus for the assembly of a first type of sail eyelet;

Figures 4-6 are cross-sectional schematic views at

different times and a view of a detail of part of a first embodiment of an apparatus for the assembly of a second type of sail eyelet;

Figures 7-9 are cross-sectional schematic views at different times and a view of a detail of part of a second embodiment of an apparatus for the assembly of a first type of sail eyelet;

Figures 10-12 are cross-sectional schematic views at different times and a view of a detail of part of a second embodiment of an apparatus for the assembly of a second type of sail eyelet;

Figures 13-15 are cross-sectional schematic views at different times and a view of a detail of part of a third embodiment of an apparatus for the assembly of a second type of sail eyelet;

Figures 16-18 are cross-sectional schematic views at different times and a view of a detail of part of a third embodiment of an apparatus for the assembly of a first type of sail eyelet.

[0019] With reference to the figures, first the method of assembly will be described in terms of its characteristics that are common to all the embodiments of the apparatus and/or sail eyelet that will be presented.

[0020] In broad terms the method of the invention relates to the assembly of a sail eyelet 1, 1A on a flap of flexible material 2 at a perforated seat 8 which is provided in said material.

[0021] The sail eyelet can be of the first type, designated with the reference numeral 1 or of a second type, designated with the reference numeral 1A; in general for the latter the same parts as in the former are designated with the same reference numerals followed by the letter "A".

[0022] In both types 1 and 1A, the sail eyelet comprises an eyelet 3, 3A which is provided with a first hole and a washer 4, 4A which is provided with a second hole.

[0023] We will return later to the details and differences of the embodiments 3, 3A of the eyelet and 4, 4A of the washer; for now it is sufficient to note that, on principle, the mutual anchoring is provided by the plastic deformation of part of the eyelet 3, 3A with consequent engagement and retention of the washer 4, 4A.

[0024] Once the sail eyelet 1, 1A is assembled on the flap 2, the first hole, the second hole and the perforated seat are substantially concentric, with the flexible material 2 interposed at least partially between the eyelet 3, 3A and the washer 4, 4A.

[0025] The method of assembly is carried out by way of an apparatus that comprises a press 10, 10', 10" which is adapted to cause a plastic deformation at least of part of the eyelet 3, 3A in order to result in its anchoring on the washer 4, 4A.

[0026] In this case too, we will return to the differences between the three embodiments 10, 10', 10" of the press that can be used; similarly, the same parts of the press 10 are designated with the same reference numerals followed by the primes ' or " respectively for the embodiments of the press 10', 10".

[0027] The method for assembly the invention comprises a step of retention of the flap of flexible material 2 in position, which is obtained by temporarily inserting an abutment element 11, 11', 11" of the press 10, 10', 10" into the perforated seat 8 in the condition in which the eyelet 3, 3A is not anchored to the washer 4, 4A.

[0028] In particular, the abutment element of the press can be free, as in the case of the element 11 of the press 10, which is not stably coupled to the parts of the press 10 proper, in the manner of an insert; or the abutment element of the press can be coupled to at least one part of the press, as in the case of the element 11', 11" of the press 10', 10".

[0029] In any case, the abutment element 11, 11', 11" acts as a retaining shoulder, being inserted into the perforated seat 8 of the flap 2 so as to retain the latter in position; this makes it possible to avoid the use of eyelets that have a long deep-drawn part, while on the contrary making it possible to reduce the axial length of the deep-drawn part of the eyelet 3, 3A. During the manufacturing, in fact, the retention function that was originally performed by the deep-drawn part of a traditional eyelet is performed by the abutment element 11, 11', 11", which is then removed when the sail eyelet 1, 1A has by that time been applied to the flap.

[0030] In some embodiments the abutment element 11, 11', 11" also acts as a guide for the plastic deformation of the eyelet 3.

[0031] In some embodiments the abutment element 11', 11" optionally comprises an axial extension 111', 111" which is designed to perform a function of engaging with the eyelet 3, 3A, so as to enable a simplified step of positioning of the latter: the eyelet 3, 3A is in fact fitted over the axial extension 111', 111" instead of being associated with the complementary mold part.

[0032] This makes it possible to use materials other than brass in order to provide the sail eyelet 1, 1A, for example materials with lower malleability, the use of which entails a reduced length of the deep-drawn part of the eyelet 3, 3A; on the other hand, if it is desired to use brass in any case, then the method of the invention enables a saving of such material.

[0033] Returning to the method, in its characteristics in common with all the embodiments, it entails that the retention of the flap of flexible material 2 in position by way of the abutment element 11, 11', 11" is a retention on a plane that is perpendicular with respect to a direction Y of approach/distancing of a primary mold part 15, 15', 15" and a complementary mold part 16, 16', 16" of the press 10, 10', 10".

[0034] Furthermore, the retention of the flap of flexible material 2 in position by way of the abutment element 11, 11', 11" is preferably maintained at least during all of the step of plastic deformation at least of part of the eyelet.

[0035] The step of retention of the flap of flexible material 2 in position, mentioned previously, is preceded by a step of positioning either the eyelet 3, 3A or the washer

4, 4A on the primary mold part 15, 15', 15"; after such step the abutment element 11, 11', 11" is arranged inside the hole of the eyelet 3, 3A (or of the washer 4, 4A) and remains in such position during the positioning of the flap 2 which is fitted over with the perforated seat 8 so as to surround the abutment element 11, 11', 11".

[0036] Now we will describe first the two different types of sail eyelet 1 and 1A and then the manufacturing apparatus with the associated presses 10, 10', 10".

[0037] The sail eyelet 1 and 1A of both embodiments is preferably made of zamak, even more preferably by way of a die casting technique, so as to be relatively economic and simple to provide.

[0038] The principal difference between the sail eyelet 1 and the sail eyelet 1A lies in the shape structure of the parts that are subjected to plastic deformation, which make it possible to anchor the eyelet 3, 3A and the washer 4, 4A.

[0039] In the first embodiment 1, the eyelet 3 has a body part 30 (extending radially) and an edge 31 (extending axially) which are mutually connected; the edge 31 extends around the first hole and is intended to be plastically deformed during the manufacturing in order to carry out the anchoring with the washer 4.

[0040] In the second embodiment 1A, instead, the eyelet 3A comprises, in addition to the body part 30A and to the edge 31A which are arranged similarly to as described above, fixing pins 32A which extend axially (substantially parallel to the edge 31A); the washer 4A comprises passage holes into which (in the mounted condition) the pins 32A extend. In this second embodiment, in fact, the anchoring between the eyelet 3A and the washer 4A occurs by virtue of the plastic deformation of the free ends of the pins 32A, which generate the necessary undercut to anchor the eyelet and the washer.

[0041] These solutions, in particular the embodiment of the sail eyelet 1A, are found to be particularly useful when the material used is zamak, which has a lower malleability than that of brass and in which, therefore, the plastic deformations must be contained and localized in order to not generate fractures or cracks.

[0042] Turning now to describe the various embodiments of the manufacturing apparatuses, which are also the subject of the invention, the accompanying figures show, by way of non-limiting example, three different embodiments of parts of the presses 10, 10', 10" that are part of the apparatuses proper.

[0043] In all the embodiments, the presses 10, 10', 10" comprise a primary mold part 15, 15', 15" and a complementary mold part 16, 16', 16", at least one of which can move in order to allow a mutual approach/distancing in the direction Y, which is useful to causing the plastic deformation of a part of the eyelet (the edge 31 or the pins 32A) in order to thus provide the anchoring with the washer 4, 4A.

[0044] Preferably the primary mold part 15, 15', 15" and the complementary mold part 16, 16', 16" move toward/away from each other following a straight path Y which is vertical, the primary mold part 15, 15', 15" being positioned below the respective complementary mold part 16, 16', 16".

[0045] Preferably, in all the embodiments, the primary mold part 15, 15', 15" has a lower accommodation seat 17, 17', 17" defined in the primary mold part 15 proper, in which the abutment element 11, 11', 11" is accommodated.

[0046] The main difference between the embodiment 15 and the embodiments 15' or 15" lies in the fact that, in the former, the abutment element 11 is free and can move.

[0047] The abutment element 11 is inserted (for example manually) into the lower accommodation seat 17 before the eyelet and washer are anchored, and then removed when the anchoring is achieved.

[0048] To this end there is preferably an upper accommodation seat 18 defined in the complementary mold part 16: when the primary mold part 15 and the complementary mold part 16 are closed, the abutment element 11 is fully contained within them, in the seats 17 and 18; this makes it possible to use an abutment element 11 that extends considerably from the seat 17 and makes it possible to easily fit the flap 2 over it.

[0049] Considering the abutment element 11, this has shapes and dimensions that are such as to determine the plastic deformation of the edge 31 of the eyelet 3 if it is desired to assemble a sail eyelet of the type 1 described above.

[0050] In this case the abutment element 11 has, in its longitudinal extension (along its height), a substantially frustum-shaped section which is useful to deform the edge 31 and create the coupling with the washer, as shown in Figures 1-3. Preferably, the plan dimensions of the lower portion of the abutment element 11 are such as to allow its passage in the first hole of the eyelet 3, the dimensions being slightly smaller than the latter.

[0051] The plan dimensions of the upper portion of the abutment element 11 on the other hand are slightly smaller than the hole of the washer 4 in order to allow the correct insertion.

[0052] In substance, the abutment element 11 in this embodiment has a diameter of its top portion greater than the diameter of its lower portion, as can clearly be seen from Figures 1-3.

[0053] Turning now to examine the embodiment shown in Figures 4-6, the abutment element 11 does not necessarily have the same shape as the corresponding element in Figures 1-3, in view of the fact that the deformation that produces the engagement between the eyelet and the washer does not occur on the rim 31, but at the pins 32A; for example while the abutment element 11 in Figures 1-3 has a substantially frustum-shaped section, the abutment element 11 in Figures 4-6 is substantially provided by joining two cylinders of different sizes, which thus identify a transverse step or notch that acts as the seat of the edge 31A of the eyelet 3A, which remains unaltered and not deformed (Figure 6).

[0054] Obviously, in both embodiments, both the primary mold part 15, 15', 15" and the complementary mold part 16, 16', 16" have seats for accommodating the eyelet or the washer; on this point note that, irrespective of the type of sail eyelet 1 or 1A, the washer 4 or 4A in the press 10 is associated with the complementary mold part 16 which has a corresponding seat.

[0055] Turning now to describe the press 10', 10" in the remaining figures, note that in them the abutment element 11', 11" is not free, but is fixed so that it can move to the primary mold part 15', 15".

[0056] In this case, on the primary mold part 15', 15" there is also a front plate 20', 20".

[0057] The difference between the press 10' and the press 10" lies mainly in the plate 20', 20" which is movable in the first case (press 10') and is fixed in the second case (press 10").

[0058] The front plate 20', 20" is interposed between the primary mold part 15', 15" and the complementary mold part 16', 16" and is provided with a passage opening in which the abutment element 11', 11", which is fixed so that it can move to the primary mold part 15', 15", slides; preferably the abutment element 11', 11" is coupled to the primary mold part 15', 15" so that it can move elastically between an extended position and a compressed position.

[0059] For this purpose there is a first elastic element 21', 21", for example a spring, interposed between a base of the abutment element 11', 11" and the primary mold part 15', 15".

[0060] The abutment element 11', 11" can move in the direction Y of approach/distancing of the primary mold part 15', 15" and the complementary mold part 16', 16", so that it can be moved at least between an extended position, in which it protrudes from the front plate 20', 20" toward the complementary mold part 16', 16", and a compressed position, in which substantially it does not protrude from the front plate 20', 20", remaining flush with the latter.

[0061] When the primary mold part 15', 15" and the complementary mold part 16', 16" move toward each other in order to achieve the plastic deformation and fix the eyelet 3, 3A and the washer 4, 4A, the abutment element 11', 11" returns toward the primary mold part 15', 15", contrasting the action of the spring 21', 21".

[0062] In these embodiments the complementary mold part 16', 16" is preferably lacking the upper seat 18.

[0063] In this manner the operation of fixing of the flap 2 is facilitated, since when the primary mold part 15', 15" and the complementary mold part 16', 16" are separated, the element 11', 11" protrudes, pushed by the spring 21', 21".

[0064] In a basic embodiment (not shown), the eyelet 3, 3A before the coupling with the washer 4, 4A is associated with the seat provided in the complementary mold part 16', 16", so that prior to the formation of the sail eyelet 1, 1A proper, it is supported by the complementary mold part 16', 16"; in this case preferably the axial extension 111', 111" is absent and the abutment element 11', 11" has a sufficient length to retain the flap 2, but not to retain the eyelet 3, 3A in position; in this embodiment the upper complementary mold part 16', 16", at the abutment element 11', 11", is substantially flat and lacking dedicated seats.

[0065] In the optional advanced embodiment illustrated, on the other hand, the abutment element 11', 11" comprises an axial extension 111', 111" which is designed to engage the eyelet 3, 3A, when it is not yet coupled to the washer 4, 4A.

[0066] In this way a simplified step of positioning the eyelet 3, 3A is possible, since this is fitted over the axial extension 111', 111" instead of being coupled to the complementary mold part 16', 16".

[0067] The latter, in order to accommodate (in the closed condition on the primary mold part 15', 15") the axial extension 111', 111", has a dedicated concave seat 18', 18", which overall is similar to the seat 18 in Figures 1-6. The axial extension 111', 111" can be provided in the manner of an insert and mounted on the lower portion of the abutment element 11', 11" (as in the embodiment shown) or be monolithic with it.

[0068] Turning to the front plate 20', this can move elastically with respect to the primary mold part 15' in the direction Y (already described), there being to this end a second elastic element 25' acting between the front plate 20' and the primary mold part 15'.

[0069] This helps to retain the flap 2 in position in the step of closing the press 10'.

[0070] By contrast, in the press 10" the front plate 20" is integral with the primary mold part 15", thus providing a simpler configuration.

[0071] In the embodiment in Figures 4-6, the abutment element 11 has a diameter of the upper portion greater than the diameter of its lower portion.

[0072] By contrast, in the embodiments in Figures 7-18, the axial extension 111', 111" of the abutment element 11', 11" has a smaller diameter than the diameter of the abutment element 11', 11".

[0073] Furthermore, in the embodiments in Figures 7-9 and 16-18 the front plate 20', 20" is provided with a notch 50', 50" at the edge of the front plate 20', 20" which is adjacent to the abutment element 11', 11". Such notch enables respectively the folding of the edge 31, 32A.

[0074] Advantageously, by way of the present invention, sail eyelets, preferably made of zamak, can be provided and applied in any shape, including non-circular (in plan view), for example sail eyelets with an oval shape in plan view, or elliptical, square, polygonal and the like.

[0075] By way of the invention, in fact, it is possible to break the edge at several points and so bypass the problem of the corners.

[0076] In practice it has been found that the method and the apparatus according to the invention achieve the intended aim and objects, since they make it possible to provide a sail eyelet made of a material also other than brass, without this entailing a bad fixing of the flap of

flexible material to which the sail eyelet is applied.

[0077] Another advantage of the invention consists in that it entails a solution consisting of a method of assembly and pressing that is simple overall, in which the flap is held in position correctly and stably during assembly.

[0078] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0079] Moreover, all the details may be substituted by other, technically equivalent elements.

[0080] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0081] The disclosures in Italian Patent Application No. 102017000034811 from which this application claims priority are incorporated herein by reference.

[0082] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A method for the assembly of a sail eyelet (1, 1A) on a flap of flexible material (2) at a perforated seat (8) provided in said material, wherein the sail eyelet (1, 1A) comprises an eyelet (3, 3A) provided with a first hole and a washer (4, 4A) provided with a second hole, the first hole, the second hole and the perforated seat being, in the condition in which the sail eyelet (1, 1A) is assembled on the flap (2), substantially concentric, with the flexible material (2) interposed at least partly between the eyelet (3, 3A) and the washer (4, 4A), and wherein assembly is carried out by means of a press (10, 10', 10") which is adapted to cause a plastic deformation at least of part of the eyelet (3, 3A) in order to result in the anchoring thereof on the washer (4, 4A),
   characterized in that
   the assembly method comprises a step of retention of the flap of flexible material (2) in position, which is obtained by temporarily inserting an abutment element (11, 11', 11") of the press (10, 10', 10") into the perforated seat (8), at least in the condition in which the eyelet (3, 3A) is not anchored to the washer (4, 4A).

2. The method according to claim 1, **characterized in that** the retention of the flap of flexible material (2) in position by way of the abutment element (11, 11', 11") is a retention on a plane that is perpendicular with respect to a direction (Y) of approach/distancing of a primary mold part (15, 15', 15") and a complementary mold part (16, 16', 16") of the press (10, 10', 10").

3. The method according to claim 1 or 2, **characterized in that** the retention of the flap of flexible material (2) in position by way of the abutment element (11, 11', 11") is maintained during said step of plastic deformation at least of part of the eyelet (3, 3A).

4. The method according to claim 1, 2 or 3, **characterized in that** said plastic deformation is achieved at at least one of: an edge (31) of the eyelet (3) and/or a fixing pin (32A) provided on a body of the eyelet (3A).

5. An apparatus for the assembly of a sail eyelet (1, 1A) on a flap of flexible material (2), which comprises a press (10, 10', 10") provided with a primary mold part (15, 15', 15") and a complementary mold part (16, 16', 16"), at least one of which can move in order to allow a mutual approach/distancing along a direction (Y),
   characterized in that the primary mold part (15, 15', 15") is provided with a lower accommodation seat (17, 17", 17"),
   and the press (10, 10', 10") comprises an abutment element (11, 11', 11") which can be inserted at least into the lower accommodation seat (17, 17', 17"), so as to protrude from the primary mold part (15, 15', 15") toward the complementary mold part (16, 16', 16") in at least one condition of operation.

6. The apparatus according to claim 5, **characterized in that** said abutment element (11) is free and can move with respect to the primary mold part (15) and to the complementary mold part (16), there being an upper seat (18) in the complementary mold part (16) for containing, between the primary mold part (15) and the complementary mold part (16), said abutment element (11) in the condition in which the primary mold part and the complementary mold part are closed.

7. The apparatus according to claim 6, **characterized in that** the abutment element (11) has, in its longitudinal extension, a substantially frustum-shaped portion in order to deform an edge (31) of an eyelet (3) and create an engagement with a washer (4).

8. The apparatus according to claim 5, **characterized in that** the abutment element (11', 11") is fixed in an elastically movable manner to the primary mold part (15', 15"),
   the primary mold part (15', 15") being provided at least with a front plate (20', 20")
   wherein the abutment element (11', 11") can be moved between at least one extended position, in which it protrudes from the front plate (20', 20") to-

ward the complementary mold part (16, 16', 16"), and a compressed position, in which substantially it does not protrude from the front plate (20', 20"), there being at least one first elastic element (21', 21") which is interposed between a base of the abutment element (11', 11") and the primary mold part (15', 15").

9. The apparatus according to claim 8, **characterized in that** the front plate (20', 20") is alternately elastically movable with respect to the primary mold part (15') or fixed with respect to the primary mold part (15").

10. A sail eyelet (1A) comprising:

- an eyelet (3A), which in turn comprises a body part (30A) and an edge (31A) which extends around a hole of the eyelet (3A),
- a washer (4A), which is designed to be anchored to the eyelet (3A) at least by plastic deformation of at least part of the latter,

characterized in that

the eyelet (3A) comprises one or more fixing pins (32A) which extend axially from the body (30A) substantially parallel to the edge (31A), and the washer (4A) comprises one or more passage holes in which, in the assembled condition, said pins (32A) extend, the end thereof being designed to be deformed plastically in order to produce the anchoring between the eyelet (3A) and the washer (4A).

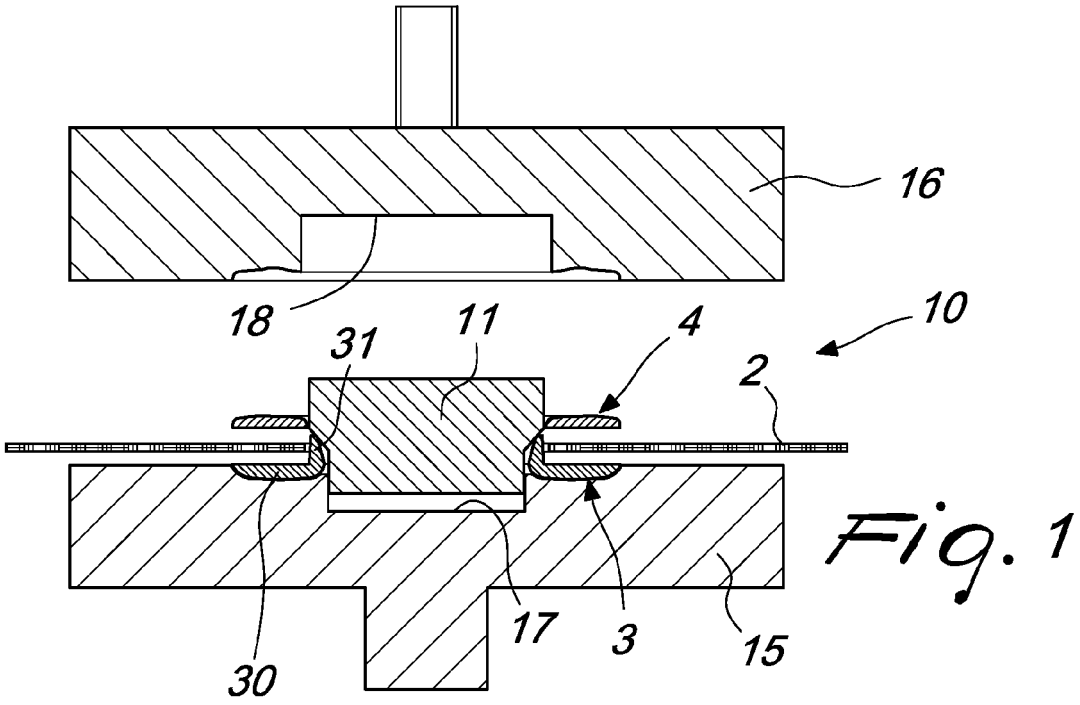


Fig. 1

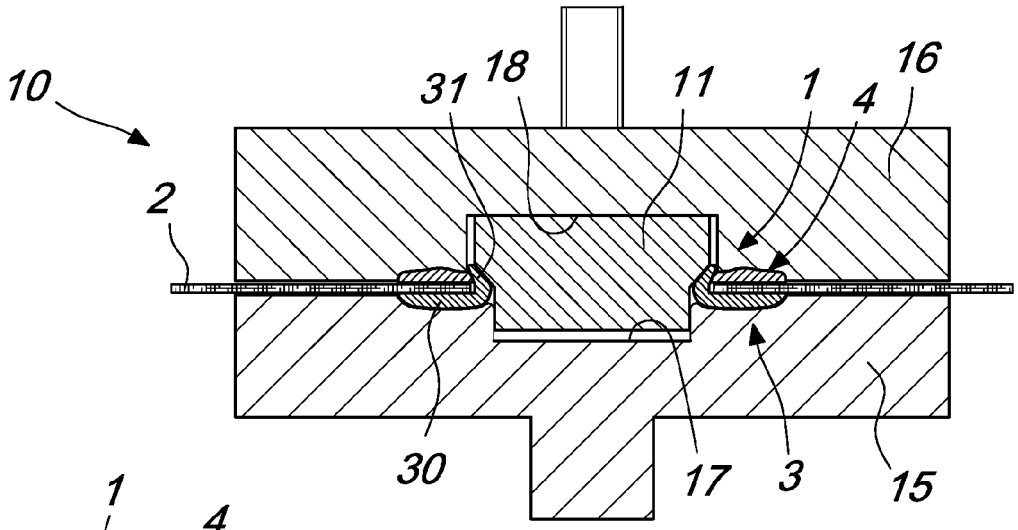
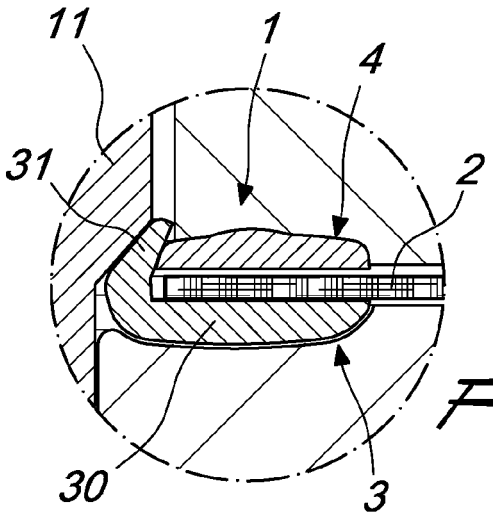


Fig. 2



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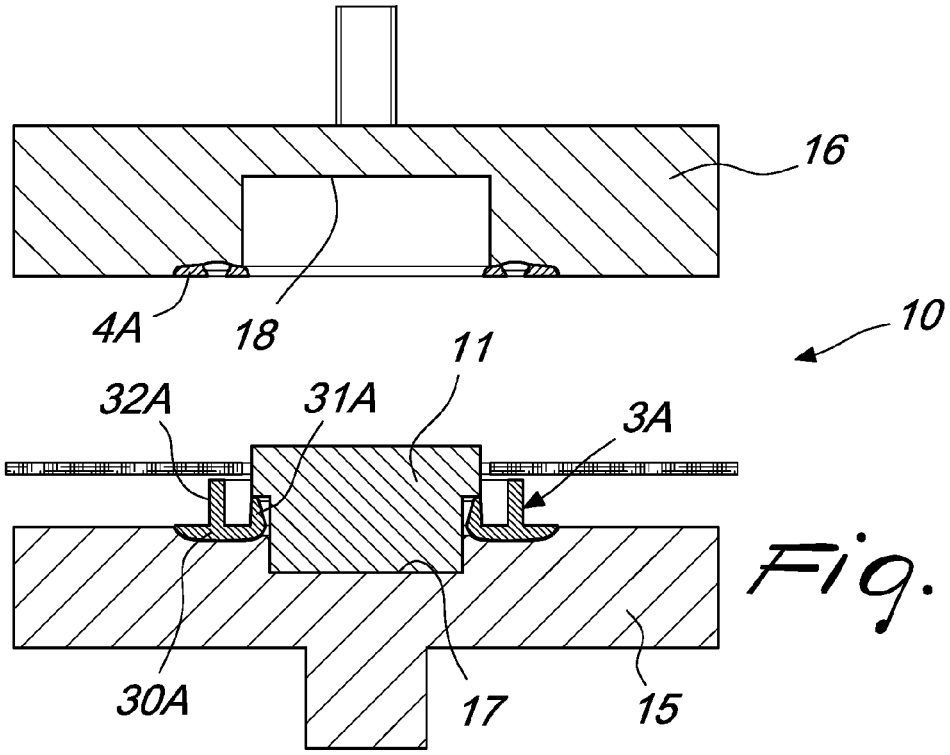

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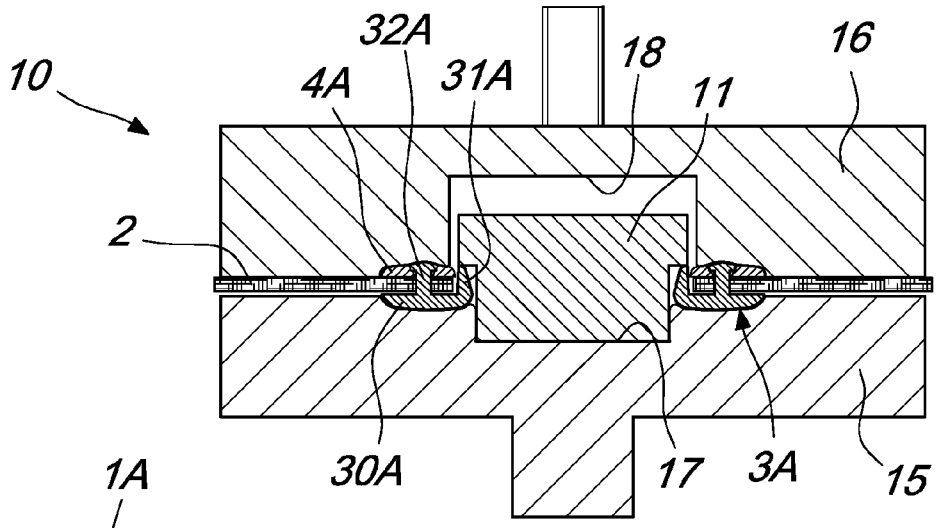
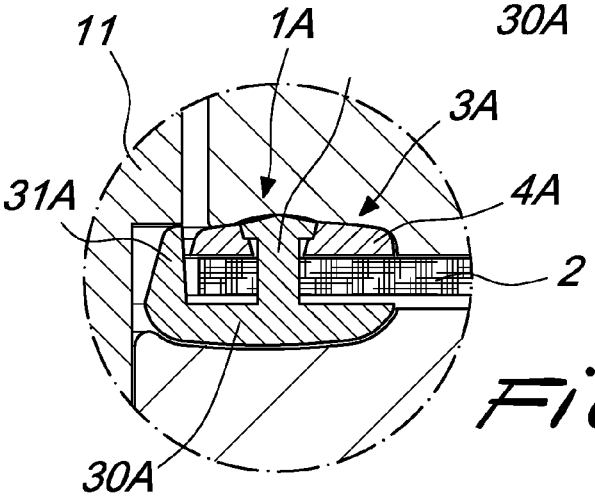


Fig. 5



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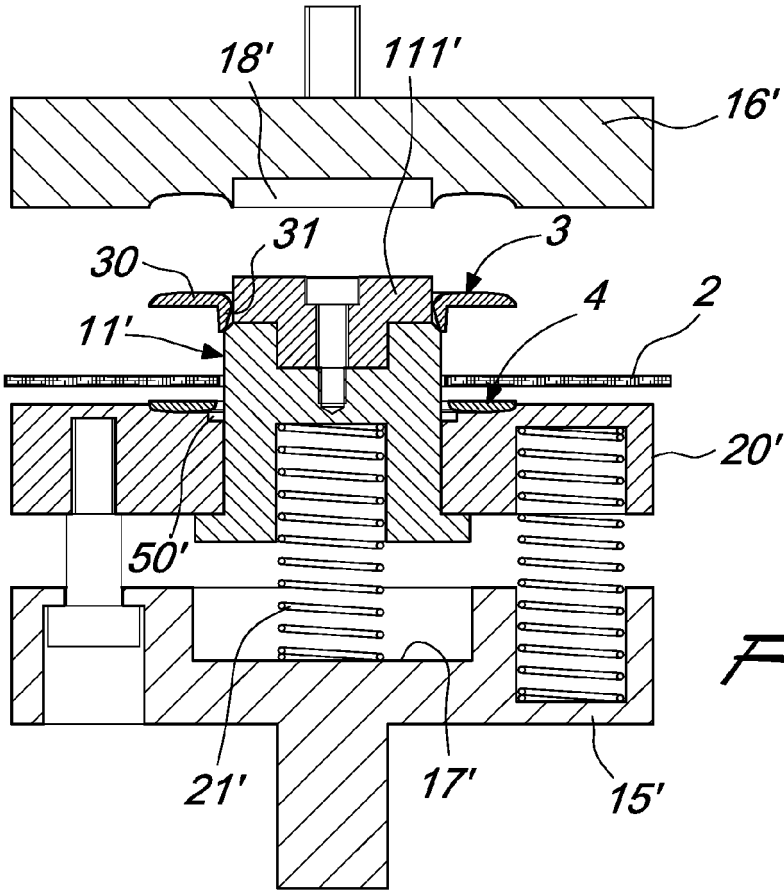

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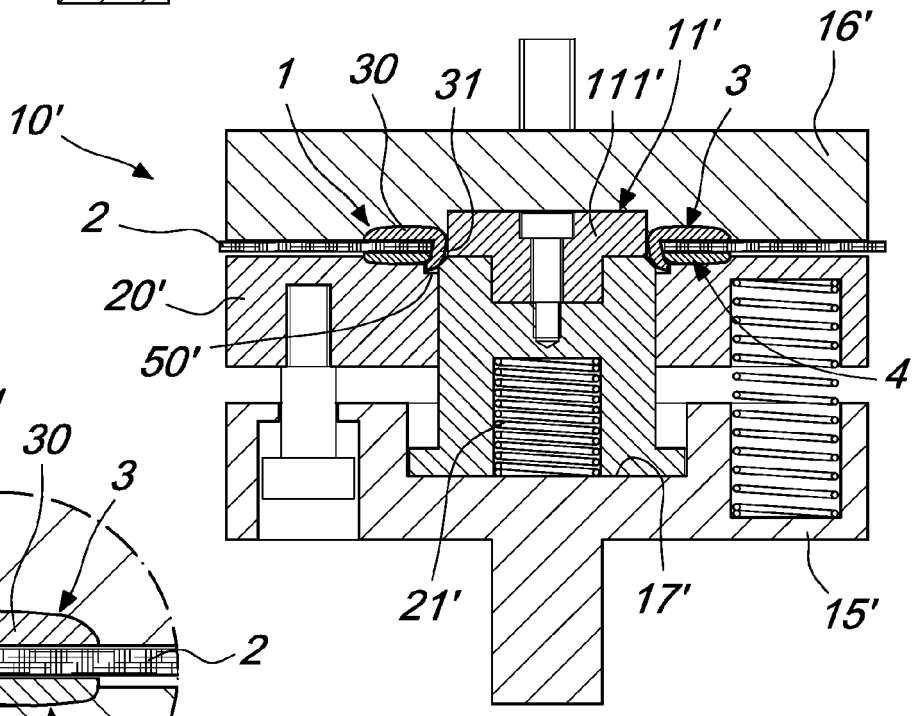

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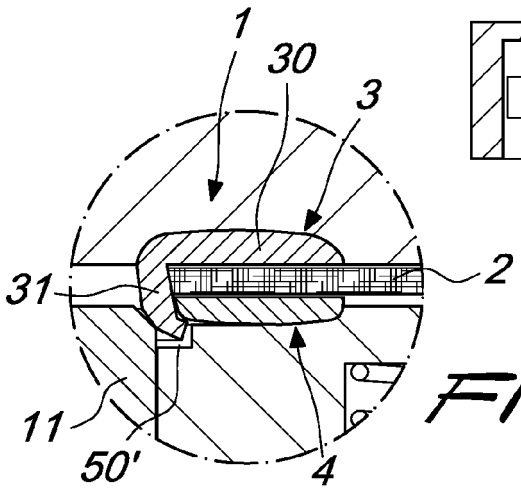

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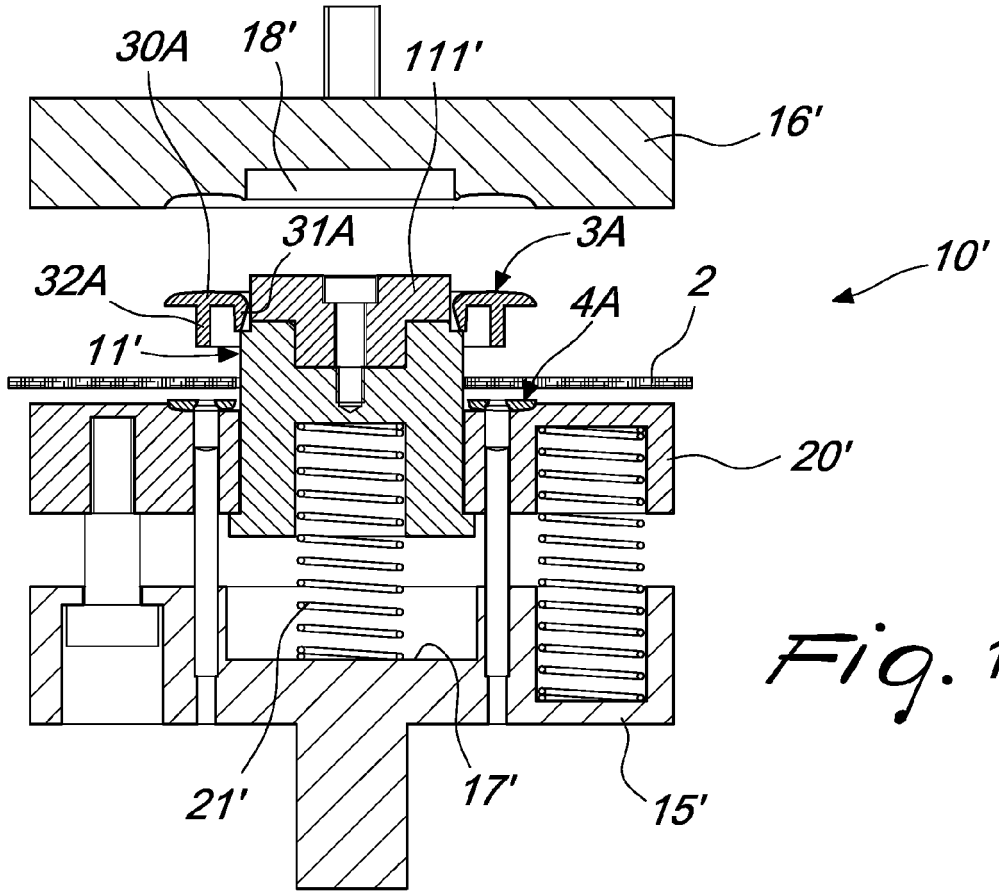
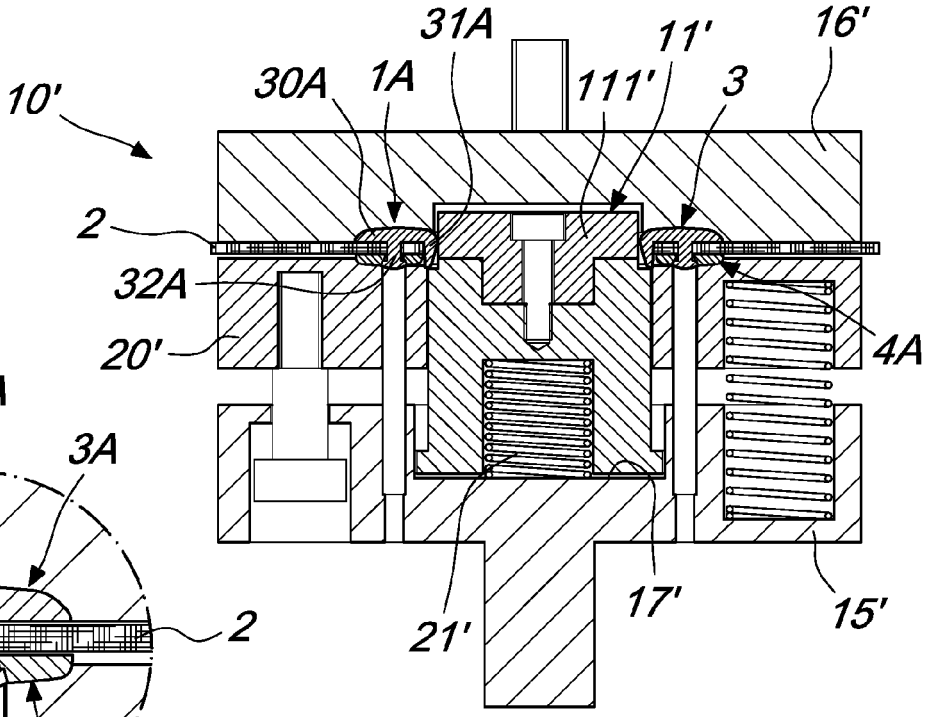


Fig. 10



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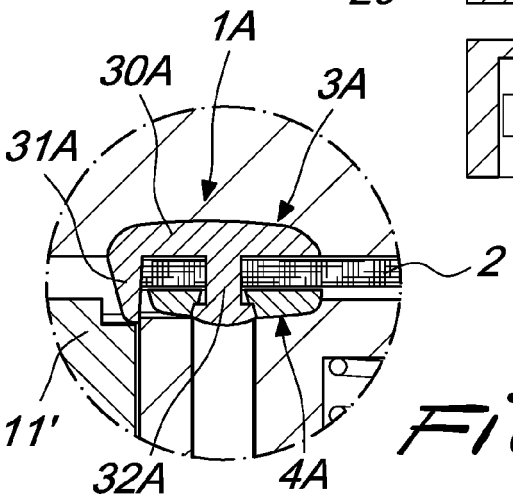

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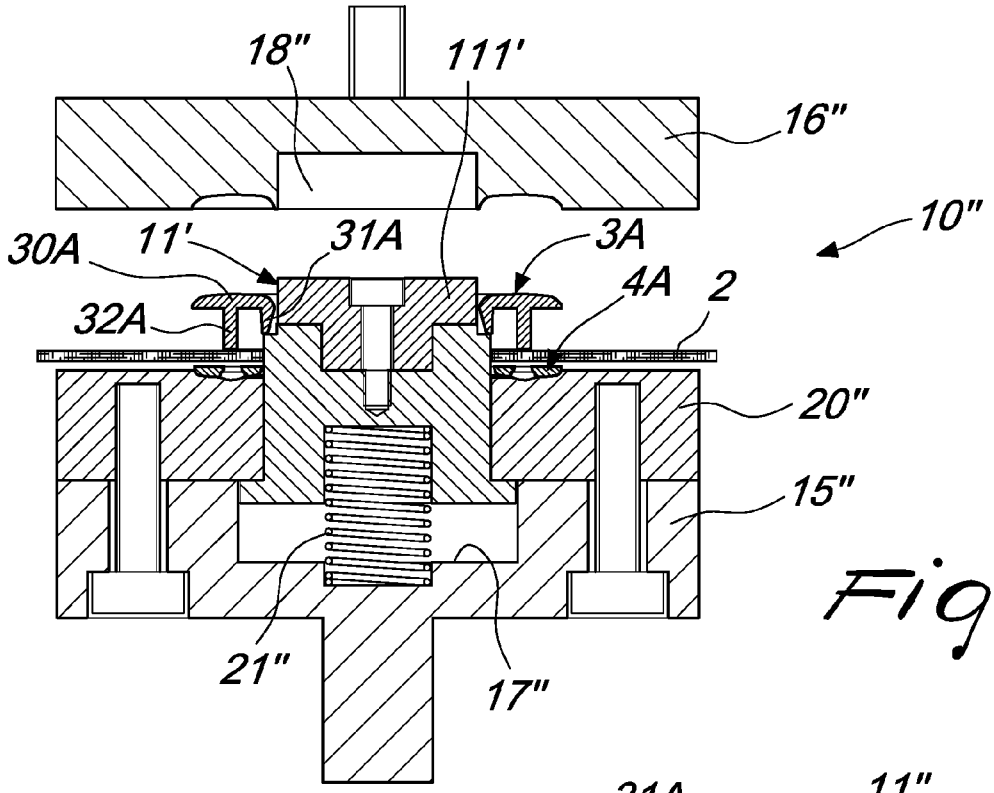

Fig. 13

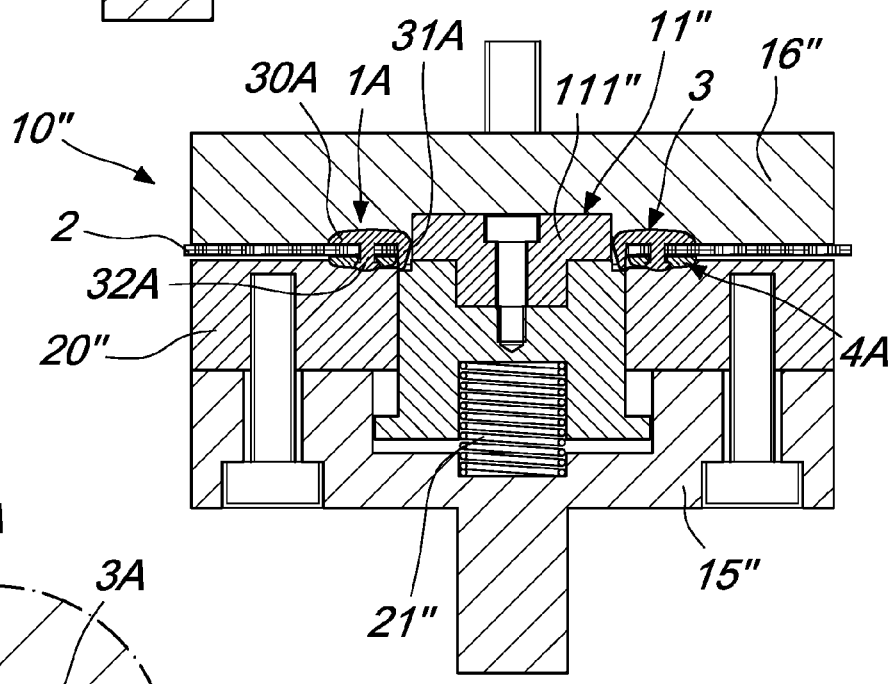

Fig. 14

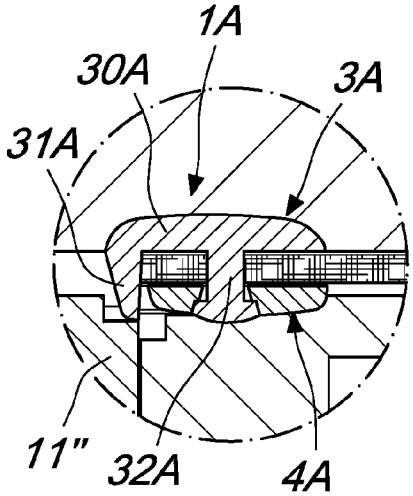

Fig. 15

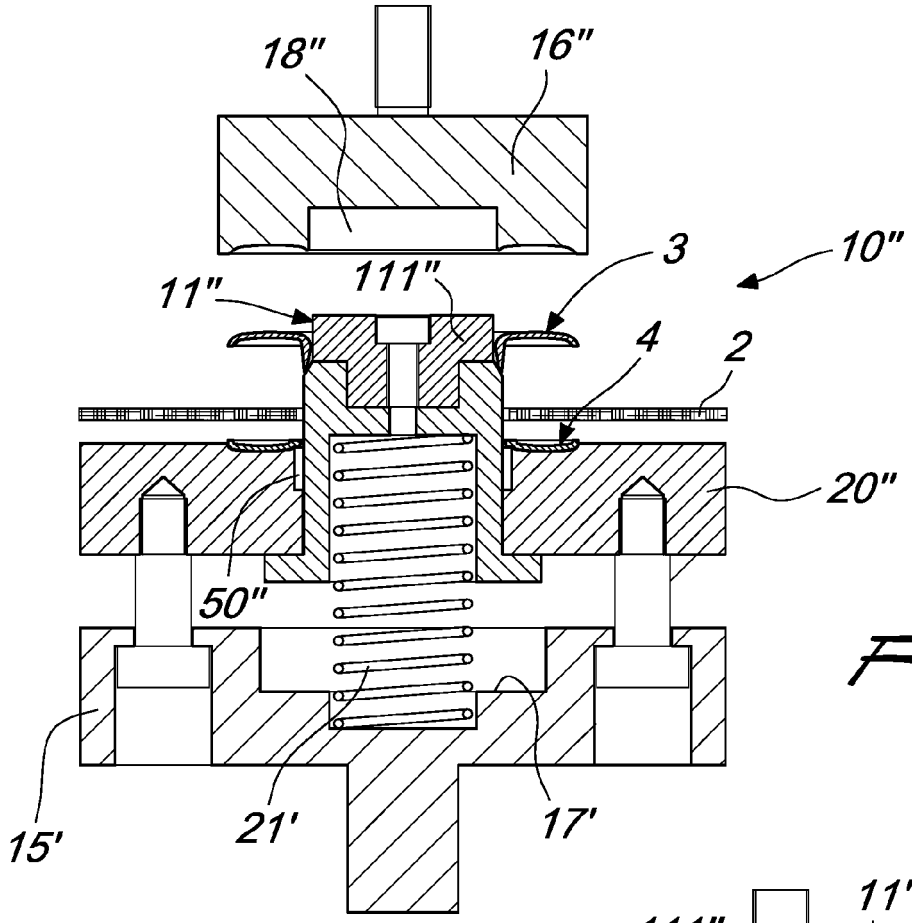

Fig. 16

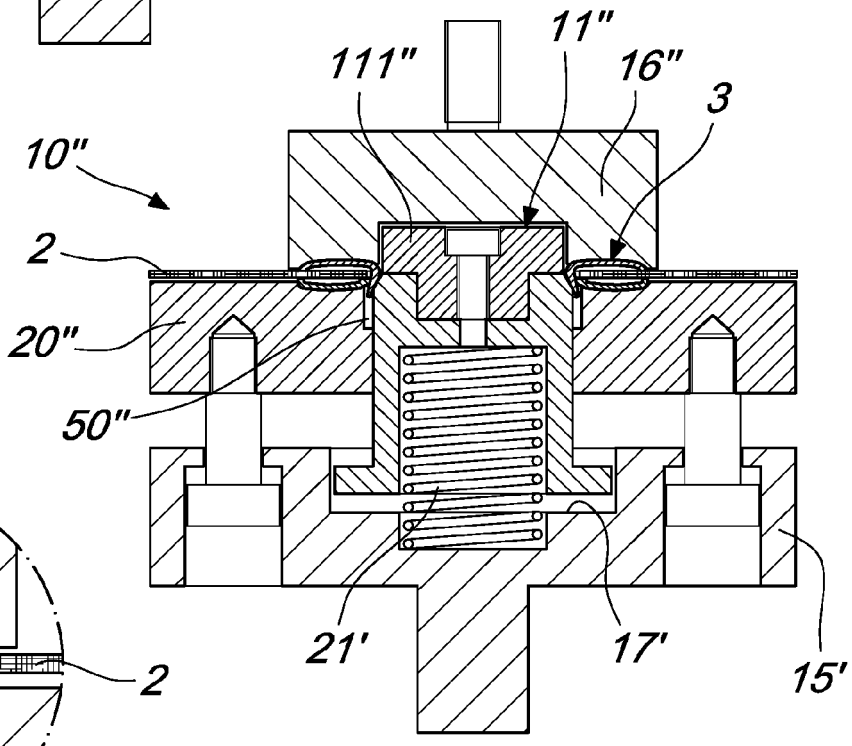

Fig. 17

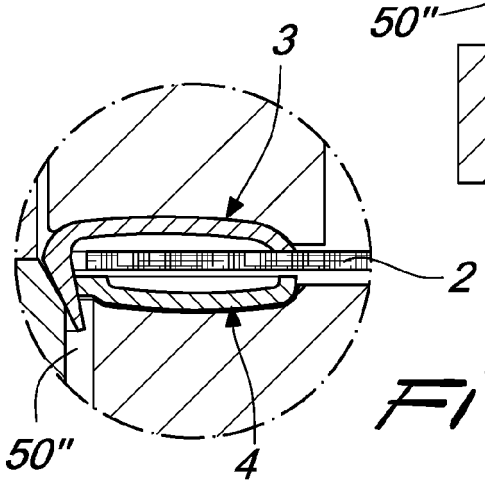

Fig. 18

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EUROPEAN SEARCH REPORT

Application Number
EP 18 16 4754

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 009 863 A1 (BENNET BOWLER SP LIMITED [GB]) 16 April 1980 (1980-04-16) * page 4, line 14 - page 7, line 22; figures * -----	1-6,8,9	INV. B21J5/08 B21J15/04 F16B19/10
X	DE 32 27 686 A1 (OMIKRON GMBH [DE]) 26 January 1984 (1984-01-26) * page 3, paragraph 2; figures * * page 6, paragraph 3 - page 7, paragraph 1 * -----	1-4	
X	US 5 191 689 A (SLESINSKI RAYMOND J [US] ET AL) 9 March 1993 (1993-03-09) * column 2, line 18 - column 4, line 8; figures * -----	1-8	
X	DE 70 42 423 U (-) 8 April 1971 (1971-04-08) * claim 1; figures 1-3 * -----	10	
X	GB 14524 A A.D. 1904 (DAVEY EDWIN JOHN) 13 April 1905 (1905-04-13) * page 2, line 42 - page 3, line 27; figures * -----	10	TECHNICAL FIELDS SEARCHED (IPC) B21J F16B B21D B63H B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 August 2018	Charvet, Pierre

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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