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(54) Fastening device

(57) A fastening device, especially for fastening roller blinds to a fixed construction, is provided, wherein the device has a front side (2) and a back side (3), and a material thickness (4) there between, and wherein one or more grooves (5) are provided in the front side, the groove(s) extending from the rim of the device into the material, and that further a first hole (6) penetrates the device from the bottom of a groove into the material in an axial distance that at least corresponds to the distance to the backside of the device and that optionally a second hole is provided from the front side into a groove in a predefined distance from the backside of the device. The device may be manufactured by a process which is selected from cutting a body of the material of choice into the shape of the fastening device; or in case of the material being a thermoplastic polymer, from injection moulding; or in case of material being a light metal, from pressure moulding.

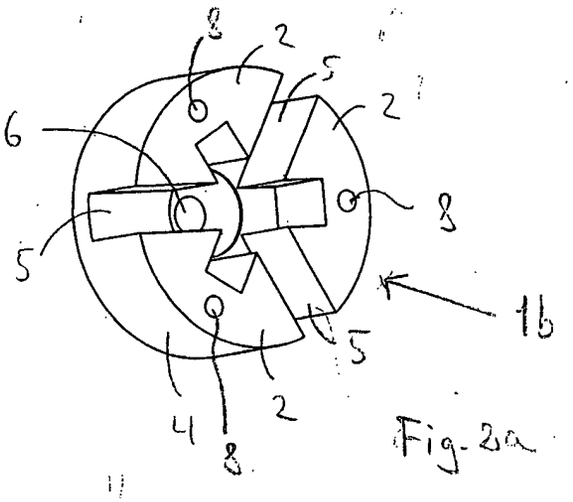

Fig. 2a

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Description

Technical Field

[0001] The present invention relates to a fastening device, especially for fastening roller blinds to a fixed construction.

Background art

[0002] A traditional roller blind usually consists of a cylindrical tube being wrapped with the fabric which serves as the blind.

[0003] One end of the tube is provided with a plug having an essentially cylindrically pin extending axially from said one end of the tube. Said pin is designed to fit into a fastening device to be fixed on e.g. the wall in a suitable position in relation to a window, and said pin located in its position in the fastening device is designed in a way which enables the pin and the tube to be freely rotational. This is usually accomplished by placing the pin in a hole in the fastening device. Usually said first pin is actuated by a spring so as to be able to be axially pushed into the plug.

[0004] The other end of the tube is provided with a second plug having a second pin extending axially from said other end of the tube. This second pin is designed to fit into a second fastening device also to be fixed on e.g. the wall in a suitable position in relation to a window. The second pin and the second fastening device are each designed in a way that locks the second pin into an essentially fixed position in relation to the second fastening device. This is usually accomplished by giving the pin and the place for its positioning on the fastening device a non-circular form; e.g. the pin being spade-shaped and the pin being placed in an oblong hole in the fastening device.

[0005] Furthermore the prior art roller blind is provided with a spring and locking mechanism that enables the fabric on the roller blind to be pulled off the tube and thus unwrapped and locked in a position so as to blind the window to an extend which is suitable for the user. This spring and locking mechanism is mechanically acting on the relative motion of the tube and the second pin. Once the fabric is unwrapped and locked and positioned in a position suitable for the user, the locking mechanism may - by careful pulling the fabric - be unlocked and this accordingly allows the blind fabric to be either further unwrapped by further pulling the fabric off the tube or to be wrapped onto the tube by simply allowing the spring to act on the tube.

[0006] Prior art fastening devices for fastening roller blinds to a fixed construction usually comprises a metal body having two elements bended in a mutual angle of 90 degrees thus defining an L-shape. One element having a number of holes which serves as recipients for the pins mentioned above (said element being arranged vertical and serving as the actual holder for the roller blind tube). The other element serves as means for mounting the fastening device on the wall, e.g. by using nuts or screws (said element being arranged horizontal on a fixed construction).

[0007] One disadvantage of the prior art fastening devices is that an L-shaped fastening device must be mounted to a fixed construction on a horizontal surface in order to allow the element of the fastening device that holds the roller blind tube to be arranged correctly (this latter element must be arranged vertically). Thus, it is not to possible to mount the above mentioned prior art fastening devices on e.g. the vertical part of a window frame.

[0008] When fastening a roller blind tube to such a prior art fastening device, the spade-shaped pin (the second pin cf. the above description) is to be positioned in its respective oblong hole in the vertical element of the fastening device. Thereafter the other pin in the other end of the roller blind tube (the circular pin cf. the above description) is by virtue of the spring actuation pushed into the plug in which it is located and said pin is then aligned with the hole in the other vertical element of the other fastening device in which it is to be fitted. When the alignment is accomplished said spring actuated pin is released so that a portion of said pin enters into the hole of the vertical element of said other fastening device in which it is to be fitted thus locking the roller blind tube into position. By these operations the mounting of the roller blind is accomplished.

[0009] However such prior art fastening devices suffers from the disadvantage that it is usually very difficult to get the pins of the roller blind tube fixed in the holes of the fastening device, and thus to fasten the roller blind tube to the fastening device. This is especially the case, when the fastening device is mounted in high places, such as at the upper part of a highly located window frame.

[0010] The ease of fixing the roller blind tube to the prior art fastening device is only worsened by the fact that in order for the roller blind tube to be able to wrap an unwrapped piece of blind fabric efficiently, the spring of the roller blind spring and locking mechanism must possess a certain degree of pretension when the roller blind is in its wrapped state. If not pretensioned in its wrapped state prior to mounting of the roller blind, the roller blind spring mechanism will simply not be able to wrap all the unwrapped fabric onto the roller blind tube efficiently resulting in a substantial length of fabric hanging under the roller blind tube when all the fabric is supposed to be wrapped onto the tube.

[0011] Accordingly, the pins of the roller blind tube not only have to be positioned in its respective holes in the prior art fastening devices which may be difficult in itself, but furthermore the fixing of the spade-shaped pin must be made when the spade-shaped pin is in a state of being actuated by the spring mechanism of the roller blind. This fixing of the spade-shaped pin in such a pretensioned state is very difficult due to the fact that the po-

sitioning of the pin into its oblong hole in the fastening device is to be made in an axial direction. Thus, at the same time of axially moving the spade-shaped pin into its position it is necessary to remove the fingers from the spade-shaped pin thereby risking that the pin starts rotating by virtue of the spring actuation before the pin is properly inserted into position. Although other L-shaped prior art fastening means overcome this disadvantage by providing - as an alternative to a hole - an aperture into which the spade-shaped pin may be slided, neither of these fastening means can be mounted on a horizontal surface

[0012] In US 4 936 728 a pair of fastening devices for a window shade are disclosed; one device having on its front side a slot member designed for engagement with the circular pin of the window shade, and the other device having on its front side an aperture member designed for engagement with the spade-shaped pin of the window shade. Each member on its respective front side has a slot designed for engagement with a screwdriver. Also, each member on its respective back side has a threaded, screw like portion extending axially there from and intended as a screw for mounting the fastening device into the wall or window frame. The teaching in US 4 936 728 solves the problem of axially moving the spade-shaped pin into its position upon mounting the device by giving one of the two fastening devices a design which allows the spade-shaped pin to be radially slided into position. However, the spade-shaped pin is not really fixed into position just by sliding it into the aperture; further operations involving twisting the spade-shaped pin is also necessary. Furthermore, the necessity of two different devices for use with a single window shade or roller blind makes the manufacture of such fastening devices expensive. Moreover the prefabricated screw extending from the back side of such a fastening device limits the possibility of proper securing the device on the wall or in the window frame in respect of the different materials which may be encountered in such wall or window frame. Such improper securing is likely to occur when the site of mounting the device is a concrete wall which most often requires metal screws in combination with an expandable member in a predrilled hole in the wall.

[0013] Accordingly there exists a need for an improved fastening device for a roller blind which allows for very easy fastening the roller blind tube to the fastening device and which allows for mounting on a vertical surface.

Brief description of the invention

[0014] According to the present invention there is provided a fastening device which overcomes the above mentioned problems.

[0015] Accordingly, the present invention relates to a fastening device, especially for fastening roller blinds to a fixed construction, wherein the device has a front side and a back side, and a material thickness there between, and that one or more grooves are provided in the front side, the groove(s) having a depth into the material thickness, and that further a first hole penetrates the device from the bottom of a groove into the material in an axial distance that at least corresponds to the distance to the backside of the device and that optionally a second hole is provided from the front side into a groove in a predefined distance from the backside of the device.

[0016] Furthermore the present invention relates to a process for the manufacture of a fastening device, wherein the process is selected from cutting a body of the material of choice into the shape of the fastening device; or in case of the material being a thermoplastic polymer, from injection moulding; or in case of material being a light metal, from pressure moulding.

[0017] The fastening device according to the present invention makes it very easy to mount the roller blind tube onto the fastening device. Furthermore, the special design of the fastening device according to the present invention makes it possible to be mounted on a vertical surface, such as a vertical surface of a window frame.

[0018] Yet another advantageous effect of the fastening device according to the present invention is that it is possible to design the fastening device so as to have very small dimensions, allowing it - in contrast to the prior art devices described above - to possess an almost invisible and thus very discrete appearance.

Drawing

[0019]

Fig. 1 is a perspective view of a first embodiment of the fastening device according to the present invention.

Fig. 2a is a perspective view of a second embodiment of the fastening device according to the present invention.

Fig. 2b is a plan view of the device of fig. 2a.

Fig 3a is a side view of a third embodiment of the fastening device according to the present invention.

Fig. 3b is a plan view of the device of fig. 3a.

Fig. 4a is a side view of a fourth embodiment of the fastening device according to the present invention.

Fig. 4b is a plan view of the device of fig. 4a.

Fig. 5a is a side view of a mounting bracket for engagement to a fastening device according to fig. 4a and 4b.

Fig. 5b is a plan view of the bracket of fig. 5a.

Detailed description of the invention

[0020] As set out above the fastening device according to the present invention has a front side and a back side, and a material thickness there between, and one or more grooves are provided in the front side, the groove(s) extending from the rim of the device into the material, the device further has a first hole that penetrates the device from the bottom of a groove into the material in an axial distance that at least corresponds to the distance to the backside of the device and that optionally a second hole is provided from the front side into a groove in a predefined distance from the backside of the device.

[0021] The first hole serves as the site for mounting the device on a wall by using a screw or other suitable fastening means. The groove serves as the recipient for the spade-shaped pin; and the second hole, if present, serves as the recipient for the other, essentially cylindrical pin. If no second hole is provided, the groove itself may serve as the recipient for the essentially cylindrical pin.

[0022] As at least one grove serves as a recipient for the spade-shaped pin it is essential that at least one groove does not extend throughout the surface so as to meet the rim of the device at two distinct places and thereby enable the pin which is to be positioned in said groove to enter at one site of the rim of the device and exit the device at another site. It is also important that the groove which is to serve as the recipient is not too curved or has a shape that otherwise prevents said groove from properly holding the spade-shaped pin into position.

[0023] In its most simple form the fastening device according to the present invention has only one groove in the front side. This groove extends from the rim of the device into the material. From the bottom of this groove a hole extends to the back side of the device. A second hole may be provided so as to extend from the front side into a groove in a predefined distance from the backside. If no second hole is provided, the groove itself may serve as the recipient for the essentially cylindrical pin.

[0024] An embodiment of such a device having only one groove is shown in Fig. 1. Fig 1 shows a fastening device 1a having a front side 2 and a back side 3 (not shown) and a material thickness 4 there between. The device 1a is provided with one groove 5 in the front side into the material, and is further provided with a first hole 6 penetrating the device from the bottom of the groove 5 into the material to the back side 3 (not shown) and a second hole 7 extends from the front side 2 into the groove 5. Furthermore the device 1a is provided with "third" holes 8.

[0025] In a preferred embodiment the fastening device according to the present invention is cylindrical having a circular front side and backside with a diameter of 8 mm to 30 mm, more preferred 10 mm to 20 mm and most preferred 12 mm to 15 mm.

[0026] The thickness of the fastening device according to the present invention may be 4 mm to 15 mm, preferably 7 mm to 12 mm, and more preferably 9 mm to 11 mm.

[0027] The groove(s) of the device according to the present invention is/are preferable 3 mm to 12 mm deep, and it/they has/have a width of 2 mm to 5 mm, more preferred approximately 3 mm.

[0028] When a fastening device according to the present invention is to be used for mounting a roller blind, the fastening device is simply mounted on the vertical surface of the window frame by fastening the device on the window frame at the appropriate position, e.g. by screwing a screw through the first hole of the device and into the window frame. This operation is repeated in the other side of the window frame using another device. Having mounted the two fastening devices according to the present invention on the window frame, the roller blind is now ready for being assembled onto the fastening devices.

[0029] This operation is accomplished by first allowing the essential cylindrical pin of one end of the roller blind tube to fit into the groove or the second hole of one device according to the present invention. Next, the other end of the roller blind tube having the spade-shaped pin extending axially out of the tube is simply slided into position in the groove of the device mounted in the other side of the window frame. These two simple operations constitute the mounting of the roller blind tube on the fastening device.

[0030] Prior to performing this second operation one should however make sure that the device is oriented in a way so that the point of intersection of the groove that is to serve as recipient of the spade-shaped pin and the rim of the device (i.e. the site where the groove meets the rim of the device) does not point downward. This will ensure that the roller blind tube will not fall down as a consequence of the action of the gravitational force.

[0031] The fastening devices according to the present invention may be mounted in the window frame by suitable means, such as screws, pins and the like. If appropriate, the devices may even be glued to the window frame.

[0032] The window frame in which the fastening device according to the present invention is to be mounted may be made of various different materials, such as plywood or other types of wooden materials, bricks or concrete. The exact way of mounting the fastening devices according to the present invention will accordingly depends on the material of the window frame. Accordingly, when the window frame is made of plywood or other wooden material, it will be appropriate to mount the fastening device by means of wood screws which are screwed directly into the wooden material. If on the other hand the material of the window frame is made of bricks, concrete or the like it will be appropriate to mount the

fastening device by means of a screw in combination with some kind of an expandable member, such as a plug in a predrilled hole.

[0033] In a preferred embodiment according to the present invention, the fastening device is provided with three intersecting grooves. These grooves are in a yet more preferred embodiment arranged so as to form a mutual angle of 120 degrees. The presence of three intersecting groves in a mutual angle of 120 degrees has the advantage that al least one of the three intersecting grooves always points upward (as opposed to downward), making the exact axial orientation of the device arbitrary. Another advantage is that the three intersecting grooves in a mutual angle of 120 degrees themselves define the second hole in which the essentially cylindrical pin of the roller blind tube is to be fitted. In such an embodiment it is further preferred that the first hole and the second hole are essentially axially aligned.

[0034] An embodiment of such a device having three intersecting grooves is shown in Fig. 2a. and 2b. Fig 2a shows a fastening device 1b having a front side 2 and a back side 3 (not shown) and a material thickness 4 there between. The device is provided with three grooves 5 in the front side into the material, and is further provided with a first hole 6 penetrating the device from the bottom of the groove 5 into the material to the back side 3 (not shown) and a second hole which is defined by the three intersecting grooves extends from the front side 2 into the three intersecting grooves 5. Furthermore the device 1b in fig. 2a and 2b is provided with "third" holes 8.

[0035] Fig 2b shows a plan view of the device 1b of fig 2a. In this figure the second hole is clearly seen as defined by the three intersecting grooves.

[0036] In another preferred embodiment of the fastening device of the present invention the back side of the device extends integrally into an expansion member, said expansion member being cylindrical having an outer diameter larger than the diameter of the first hole, which expansion member being arranged centrally along the centre axis of the first hole, which hole extends at least a substantial part of the way through the expansion member.

[0037] Such an embodiment is useful when the fastening device is to be mounted in a window frame made of e.g. bricks, concrete or the like. The presence of the integral expandable member makes the use of an external provided expandable member unnecessary and thus makes the mounting of the fastening device on the fixed construction easier.

[0038] In the embodiment in which the fastening device is provided with an expansion member, the outer diameter of the cylindrical expansion member is 4 mm to 12 mm, more preferred 6 mm to 10 mm and still more preferred about 8 mm, and the extension of the expansion member along the centre axis of the second hole is 10 mm to 50 mm, more preferred 15 mm to 35 mm and still more preferred 20 mm to 30 mm.

[0039] The first hole may extend all the way through the expansion member or only part of the way through the expansion member. It is however preferred that said hole extends at least a substantial way though said expansion member, such as more than 50%, preferably more than 60 % and more preferred more than 75 % of the axially dimension of the expansion member.

[0040] An embodiment of such a device having an expandable member is shown in Fig. 3a and 3b. Fig. 3a is a side view and fig. 3b is a front view. Accordingly, fig 3a and 3b show a fastening device 1c having a front side 2 and a back side 3 and a material thickness 4 there between. The device is provided with three grooves 5 in the front side 2 into the material, and is further provided with a first hole 6 penetrating the device from the bottom of the groove 5 into the material to the back side 3 and a second hole as defined by the three intersecting grooves extends from the front side 2 into the grooves 5. Furthermore the device 1c is provided with "third" holes 8. Finally the device 1c is provided with a cylindrical expansion member 9 which is integral with and extending from the back side 3.

[0041] In another preferred embodiment, the fastening device according to the present invention is designed in a way, wherein the device on the back side and integral with said device is provided with a leg portion, said leg portion extending in a direction parallel to the plane defined by the back side, said leg portion having means for detachably engaging a mounting bracket, said bracket being suitable for fastening to a fixed construction and further that the means for detachably engaging the bracket or the engagement section on the bracket comprises resilient or flexible engagement means.

[0042] The above embodiment of the fastening device according to the present invention enables the roller blind to be fixed in a position that extends a certain distance from the window frame. This is achievable due to the fact that the fastening device for the roller blind is mounted on a detachable mounting bracket, which itself is mounted in the window frame or even on the wall surrounding the window frame. Furthermore, the above embodiment of the fastening device having a leg portion also allows that the fastening device extends downward from a horizontal surface, such as the upper part of the window frame or even from the ceiling. This can be made possible by proper design of the mounting bracket.

[0043] An embodiment of such a device having a leg portion is shown in Fig. 4a and 4b. Fig. 4a is a side view and fig 4b is a plan view showing a fastening which additionally is provided with a leg portion. Accordingly, fig 4a and 4b show a fastening device 1d having a front side 2 and a back side 3. The device 1d is provided with three grooves 5 in the front side into the material, and is further provided with a first hole 6 penetrating the device from the bottom of the groove 5 into the material to the back side 3 and a second hole as defined by the

three intersecting grooves extends from the front side 2 into the grooves 5. Finally the device 1d on fig. 4a and 4b is provided with a leg portion 10 which is integral with and extending from the back side 3. The leg portion is provided with flexible means 11 for detachably engaging a mounting bracket which is suitable for mounting to a fixed construction

[0044] Fig. 5a and fig 5b show an example of a mounting bracket 17 to be used with a fasting device 1d having a leg portion. Fig 5a and 5b are views of a mounting bracket 17 comprising a hollow member 12 having in one end an opening 13 for receiving the leg portion 10 of the fastening device 1d and another closed end 14 provided with mounting holes 15. Furthermore the mounting bracket is provided with means 16 for locking the flexible means 11 of the fastening device 1d onto the mounting bracket.

[0045] The leg portion of such a fastening device according may extend 5 mm to 90 mm, preferably 15 mm to 70 mm and most preferred 20 mm to 45 mm, and the bracket may overlap the leg portion by 5 mm to 50 mm, more preferred 10 mm to 35 mm.

[0046] In a yet further embodiment the fastening device according to the present invention comprises one or more "third" holes from the front side to the back side, offset from the first hole.

[0047] The presence of such third hole or holes allows for further attachment of the fastening device to the fixed construction in cases where the back side of the fastening device is in direct contact with a fixed construction.

[0048] The fastening device according to this embodiment can be further attached to the fixed construction by hammering one or more pins through the respective "third" hole or holes of the fastening device and into the fixed construction. In addition to preventing the fastening device from rotating and thus risking the spade-shaped pin to leave its groove by virtue of the gravitational force, such pin or such pins will further serve as additional attachment means for the fastening device per se.

[0049] According to the present invention a process for manufacturing the fastening device is also provided.

[0050] The fastening device according to the present invention may be made of any suitable material, such as polymers, for example thermoplastic polymers, such as PP (polypropylene), PE (polyethylene), POM (polyoxymethylene), PVC (polyvinyl chloride), PBT (polybutadiene terepthalate), PS (polystyrene) or PC (polycarbonate); or fibre reinforced polymers; or light metals, such as aluminium.

[0051] The preferred material of the fastening device according to the present invention is PP, PE, POM, PVC, PBT, PS or PC.

[0052] The fastening device according to the present invention may be made in any suitable way, such as by cutting a body of the material of choice. Alternatively the fastening device according to the present invention may be manufactured by pressure moulding of a light metal, such as aluminium. However, it is preferred to manufacture the fastening device according to the present invention by injection moulding of PP, PE, POM, PVC, PBT, PS or PC.

Claims

1. A fastening device, especially for fastening roller blinds to a fixed construction, wherein the device has a front side and a back side, and a material thickness there between, and that one or more grooves are provided in the front side, the groove (s) extending from the rim of the device into the material, and that further a first hole penetrates the device from the bottom of a groove into the material in an axial distance that at least corresponds to the distance to the backside of the device and that optionally a second hole is provided from the front side into a groove in a predefined distance from the backside of the device.

2. A fastening device according to claim 1 wherein the device is provided with three intersecting grooves that are arranged in mutual angles of approximately 120 degrees and wherein a second hole is present, said second hole being defined by the three intersecting grooves.

3. A fastening device according to claim 2 wherein the device is circular and the grooves are arranged such that the grooves intersect in the centre of the device and wherein the first hole is provided at the centre.

4. A fastening device according to any preceding claim wherein extending from and integral with the back side of the device an expansion member is provided, said expansion member being cylindrical having an outer diameter larger than the diameter of the first hole, and arranged centrally along the centre axis of the first hole, which hole extends at least a substantial part of the way through the expansion member.

5. A fastening device according to claim 1, 2 or 3 wherein on the back side of the device and integral with said device a leg portion is provided, said leg portion extending in a direction parallel to the plane defined by the back side, said leg portion having means for detachably engaging a mounting bracket, said bracket being suitable for fastening to a fixed construction and further that the means for detachably engaging the bracket or the engagement section on the bracket comprises resilient or flexible engagement means.

6. A fastening device according to claim 1 to 4 wherein

the device comprises one or more "third" holes from the front side to the back side, offset from the first hole.

7. A fastening device according to any preceding claim wherein the device is circular and 4 mm to 15 mm, preferably 7 mm to 12 mm, and more preferably 9 mm to 11 mm thick, and that the diameter of the device is 8 mm to 30 mm, preferably 10 mm to 20 mm and most preferred 12 mm to 15 mm, and that the groove/grooves is/are 3 mm to 12 mm deep, and that the groove/grooves is/are 2 mm to 5 mm, more preferred 3 mm wide.

8. A fastening device according to claim 4 wherein the outer diameter of the cylindrical expansion member is 4 mm to 12 mm more preferred 6 mm to 10 mm and still more preferred about 8 mm, and the extension of the expansion member along the centre axis of the second hole is 10 mm to 50 mm, more preferred 15 mm to 35 mm and still more preferred 20 mm to 30 mm.

9. A fastening device according to any preceeding claim wherein the device is made of polymers, for example thermoplastic polymers such as PP, PE, POM, PVC, PBT, PS or PC; or fibre reinforced polymers; or light metals, such as aluminium.

10. A fastening device according to claim 5 wherein the leg portion extends 5 mm to 90 mm, preferably 15 mm to 70 mm and most preferred 20 mm to 45 mm, and that the bracket overlaps the leg portion by 5 mm to 50 mm, more preferred 10 mm to 35 mm.

11. A fastening device according to any preceding claim, wherein the first and second hole are essentially axially aligned.

12. A process for the manufacture of a fastening device according to any of the preceding claims, wherein the process is selected from cutting a body of the material of choice into the shape of the fastening device; or in case of the material being a thermoplastic polymer, from injection moulding; or in case of material being a light metal, from pressure moulding.

13. A process according to claim 12, wherein the fastening device is manufactured by injection moulding of thermoplastic polymers such as PP, PE, POM, PVC, PBT, PS or PC; or fibre reinforced polymers.

14. A process according to claim 12, wherein the fastening device is manufactured by pressure moulding of a light metal, such as aluminium.

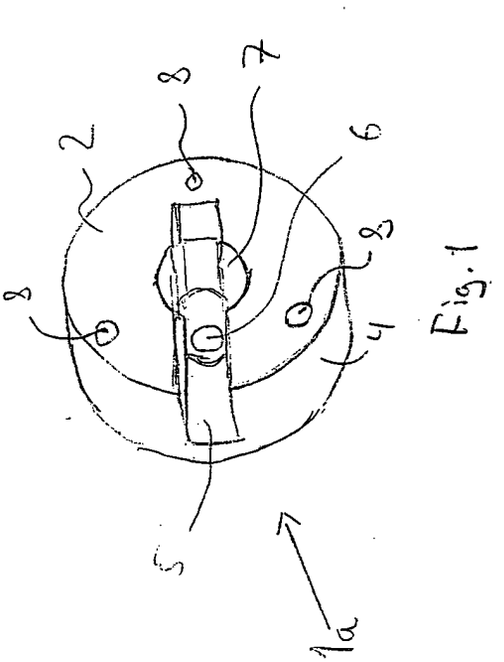

Fig. 1

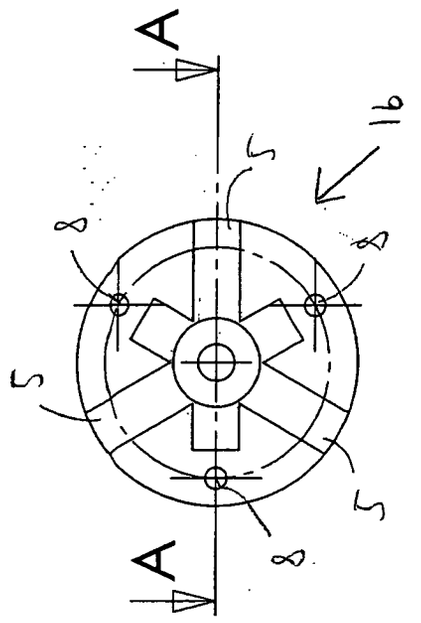

Fig. 2b

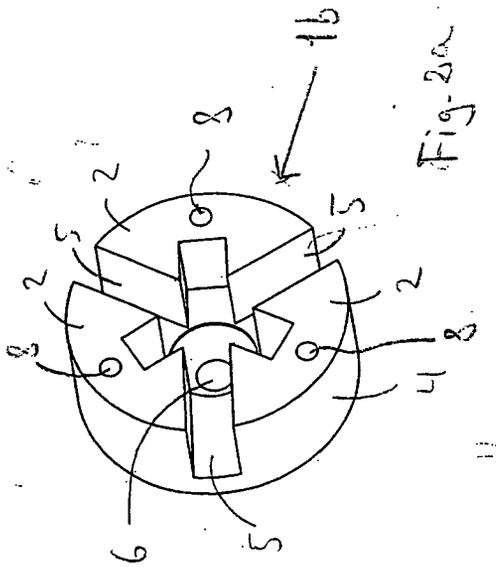

Fig. 2a

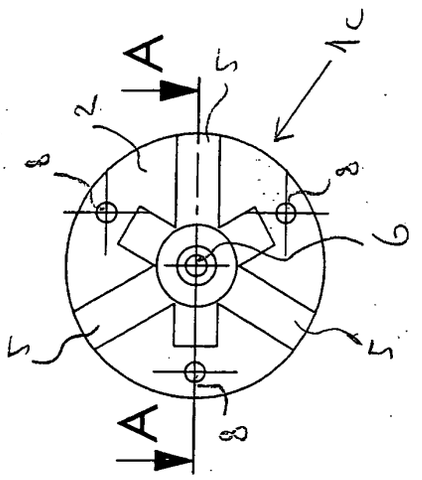

Fig. 3b

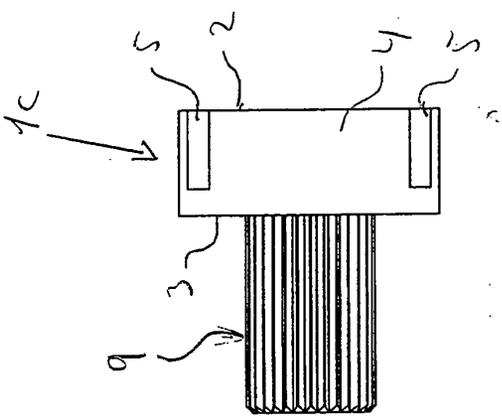

Fig. 3a

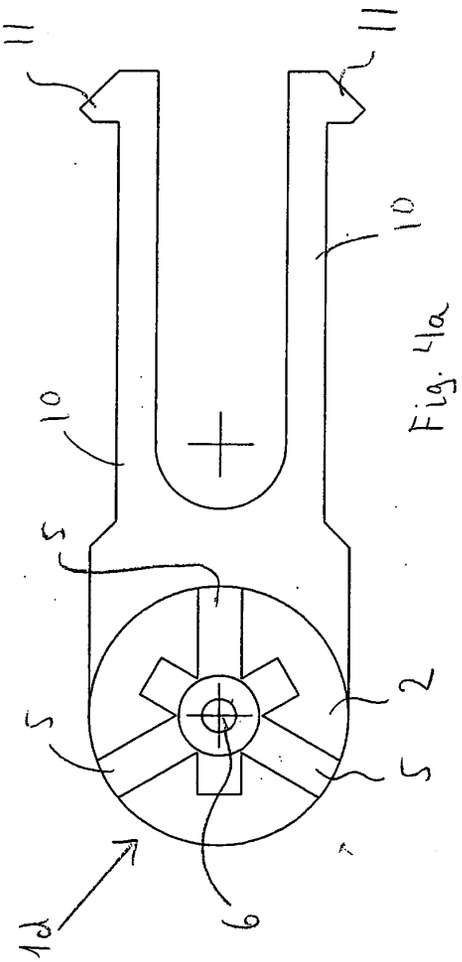

Fig. 4a

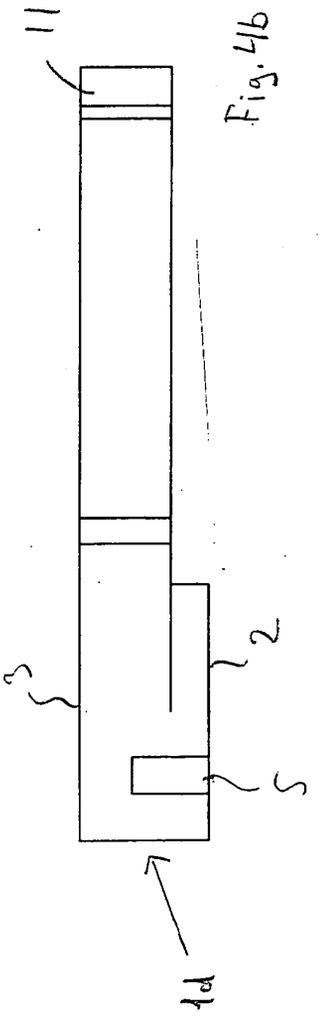

Fig. 4b

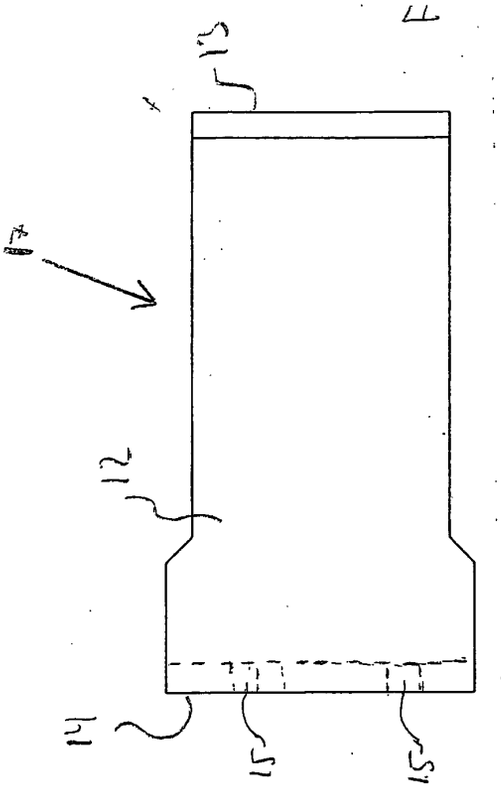

Fig. 5a

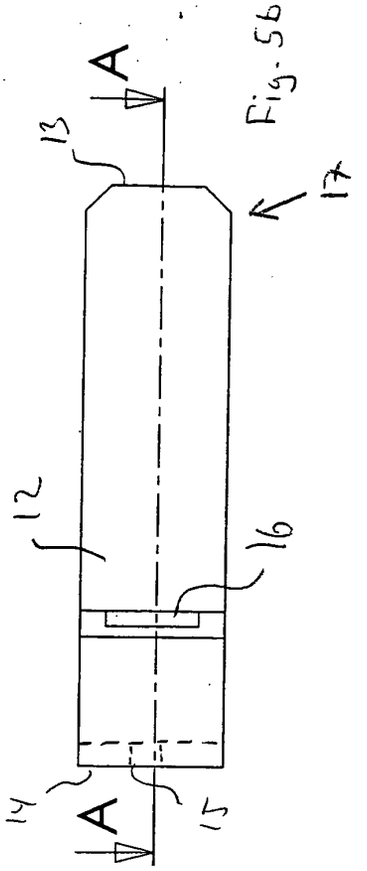

Fig. 5b

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EUROPEAN SEARCH REPORT

Application Number
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Place of search	Date of completion of the search	Examiner
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