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(54) **A METHOD AND AN EQUIPMENT FOR INSTALLING A MEDICINE CAPSULE ON A SUPPORT** ✓

VERFAHREN UND EINRICHTUNG ZUM ANBRINGEN EINER MEDIKAMENTENKAPSEL AUF
EINEM TRÄGER

PROCEDE ET EQUIPEMENT POUR INSTALLER UNE CAPSULE DE MEDICAMENT SUR UN
SUPPORT

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Description

The present invention relates to a method and an equipment for installing a tubular medicinal capsule on a support. The medicinal capsule concerned may be e.g. a capsule releasing a contraceptive substance, and which is installed on a suitable support for fixing the capsule inside the womb. Such contraceptive means are known per se and manufactured in different ways. In these, the support is formed from an anchor-like element of an inert substance, on whose arm the hollow tubular medicinal capsule is installed.

It is known to install such a tubular medicinal capsule on the support by swelling of the capsule in a suitable solvent and thereafter inserting the capsule in its swollen state on the support. The capsule shrinks as the solvent evaporates, and consequently becomes fastened on the support.

In the method and equipment according to the invention, as disclosed in claims 1 and 2, a different principle is followed. This principle is based on the expansion of the capsule by an internal pressure to such a state that the support may be inserted inside it. When the pressure has been relieved, the capsule then returns towards its initial state and becomes fastened on the support. The characteristic features of the method and equipment according to the invention appear from the enclosed claims.

The invention is described by means of the accompanying drawing, in which

Fig. 1 shows an inventive equipment in the initial step of the installation of a medicinal capsule;

Fig. 2 shows the next step of the operating cycle of the installation;

Fig. 3 shows the equipment in an installation step, where the medicinal capsule is in a closed connecting mould;

Fig. 4 shows the equipment in an installation step, where the support is in the initial state of the installation step;

Fig. 5 shows the equipment in the final step of the installation;

Fig. 6 shows the equipment after the installation has been completed;

Fig. 7 shows the equipment in the removal step of the ready product.

Fig. 1 shows the basic parts of the inventive equipment in the initial step of the installation cycle. A connecting mould or housing 4 is in its open position and a pressure needle 7 is inserted in an opening 5 of the mould prepared to receive a capsule 1, which is brought

to the connecting mould on a mandrel 6, when the mould is open. When the capsule supported by the mandrel and the pressure needle meet at the mouth of the opening of the mould, the pressure needle starts a withdrawal movement. After this, the mandrel 6 and the capsule 1 thereon as well as the pressure needle located against the end of the capsule continue their movement in a direction, where the capsule advances into the open mould.

When the capsule has totally entered into the connecting mould, the situation is as shown in Fig. 3, i. e. the mould is closed and the mandrel 6 has started its return movement. At the same time, the pressurized needle 7 follows the mandrel inside the capsule, and expands then the capsule by means of air discharging from the openings at the needle tip, and thereby helps the removal of the mandrel. After the mandrel has left the capsule and the pressure needle has reached the end of the capsule, a support 3 on which the capsule is to be installed is brought to the end of the capsule, from which the mandrel has been removed, as shown in Fig. 4.

After this, the support 3 is pushed inside the capsule to follow the pressurized needle 7 expanding the capsule when escaping ahead the support, as shown in Fig. 5 and 6. When the support has been pushed to an accurate position in the capsule, the connecting mould is opened and the ready product is removed. The pressure needle is pushed to the opened mould, and the operating cycle is started from the beginning according to Fig. 1.

The equipment described also includes two guides 8, 9 on both sides of the connecting mould 4, which help the operation by guiding on one hand the movements of the mandrel 6 and on the other hand the movements of the pressure needle 7. However, these guides are not essential, if the movements of said parts and the tightness of the operation can be ensured by other means.

The cross-sectional form of the opening 5 of the connecting mould 4 is preferably selected compatible with the cross-sectional form of the support 3.

For controlling the correct mutual operation of the equipment parts, the equipment naturally includes an electric control system, whose detailed construction and operation are well known to those skilled in the art, and they do not form an essential part of the present invention.

Claims

1. A method for installing a tubular medicinal capsule (1), preferably a coated medicinal capsule, such as a contraceptive capsule, on a support (3), characterized in that an opening extending through the capsule (1) is expanded by pressurizing the opening immediately ahead of the support (3) being inserted into the opening, and thereafter fastening the capsule (1) on the support by relieving the expanding pressure.

2. An equipment for installing a medicinal capsule (1) provided with a through-opening on a rod-like support (3), such as for installing a contraceptive capsule on an arm of an anchor-like suspender, according to claim 1, **characterized** in that the equipment comprises:

- a connecting mould (4), which is provided with a through-opening (5) and being dividable into two or more parts (4', 4'') relative to at least one plane through the opening, the length of the opening exceeding the length of the capsule (1) to be installed;
- a mandrel (6) to be inserted into the opening (5) of the connecting mould (4) and withdrawable therefrom at one end of the opening (5), the outer diameter of which mandrel (6) essentially corresponds to the inner diameter of the tubular capsule (1) to be installed, and the length of which essentially corresponds to the length of the capsule (1) to be installed;
- a pressure needle (7) insertable into and withdrawable from the opening (5) of the connecting mould (4) at the end opposite to the mandrel (6) inlet end, the tip of the pressure needle (7) being open and the outer diameter of it essentially corresponding to the inner diameter of the hollow capsule (1) to be installed;
- means for inserting the support (3) into the connecting mould opening (5) from the same end as the mandrel (6), as well as for withdrawing the support therefrom;
- control means for controlling the mutual operation of the parts (4', 4'') of the connecting mould (4), the mandrel (6), the pressure needle (7) and the insertion devices of the support (3); and
- pressure means for pressurizing the pressure needle (7).

Patentansprüche

1. Verfahren zum Anbringen einer schlauchförmigen Medikamentenkapsel (1), vorzugsweise einer umhüllten Medikamentenkapsel, wie einer Empfängnisverhütungskapsel, auf einem Träger (3), dadurch **gekennzeichnet**, daß eine sich durch die Kapsel (1) erstreckende Durchgangsöffnung durch Beaufschlagung der Durchgangsöffnung mit Druck unmittelbar vor dem in die Durchgangsöffnung einzuführenden Träger (3) ausgeweitet wird und die Kapsel anschließend an dem Träger (3) befestigt wird, indem der Expansionsdruck entlastet wird.

2. Vorrichtung zum Anbringen einer mit einer Durchgangsöffnung versehenen Medikamentenkapsel (1) auf einem stabförmigen Träger (3), wie zum Anbringen einer Empfängnisverhütungskapsel auf dem Schaft eines ankerförmigen Aufhängers nach dem Verfahren gemäß Anspruch 1, dadurch **gekennzeichnet**, daß die Vorrichtung besteht aus

- einem Zusammenführungsformbüchse (4), die mit einem durchgehenden Hohlraum (5) versehen ist, und die in zwei oder mehrere Abschnitte (4', 4'') in Bezug auf zumindest eine durch den Hohlraum verlaufende Fläche eingeteilt werden kann, wobei die Länge des Hohlraums die Länge der anzubringenden Kapsel (1) überragt;
- einem in den Hohlraum (5) der Zusammenführungsformbüchse (4) an einem Ende des Hohlraums (5) einzuführenden und aus diesem herauszuziehenden Dorn (6), dessen Außendurchmesser wesentlich dem Innendurchmesser der anzubringenden, schlauchförmigen Kapsel (1) entspricht und dessen Länge wesentlich der Länge der anzubringenden Kapsel (1) entspricht;
- einer in den Hohlraum (5) der Zusammenführungsformbüchse (4) an dem der Eintrittsseite des Dorns (6) gegenüberliegenden Ende einführbaren und aus diesem herausziehbaren Drucknadel (7), deren Spitze (7) offen ist und deren Außendurchmesser wesentlich dem Innendurchmesser der anzubringenden, hohlen Kapsel (1) entspricht;
- Vorrichtungen zum Einführen des Trägers (3) in den Hohlraum (5) der Zusammenführungsformbüchse an dem gleichen Ende wie der Dorn (6), und zum Herausziehen des Trägers aus dem Hohlraum (5);
- Steuereinrichtungen zum Steuern der gegenseitigen Arbeitsweise der Abschnitte (4', 4'') der Zusammenführungsformbüchse (4), des Dorns (6), der Drucknadel (7) und der Vorrichtungen zum Einführen des Trägers (3); und
- Druckvorrichtungen zur Beaufschlagung der Drucknadel (7) mit Druck.

Revendications

1. Procédé de mise en place d'une capsule médicale (1) tubulaire, de préférence une capsule médicale revêtue, telle qu'une capsule contraceptive, sur un support (3), caractérisé en ce qu'on dilate une ouverture traversant la capsule (1) en mettant l'ouverture sous pression directement en avant du

support (3) en cours d'insertion dans l'ouverture, puis on fixe la capsule (1) sur le support en annulant la pression de dilatation.

2. Equipement de mise en place d'une capsule médicale (1), présentant une ouverture traversante, sur un support (3) en forme de tige, par exemple de mise en place d'une capsule contraceptive sur un bras d'un élément de suspension en forme d'ancre, conformément à la revendication 1, caractérisé en ce que l'équipement comprend :

- un moule de jonction (4) qui présente une ouverture traversante (5) et est agencé de façon à pouvoir être divisé en deux parties (4', 4'') ou davantage vis-à-vis d'au moins un plan passant par l'ouverture, la longueur de l'ouverture étant supérieure à la longueur de la capsule (1) à mettre en place, 15
- un mandrin (6) devant être inséré dans l'ouverture (5) du moule de jonction (4) et agencé de façon à pouvoir en être extrait à une extrémité de l'ouverture (5), le diamètre extérieur de ce mandrin (6) correspondant essentiellement au diamètre intérieur de la capsule tubulaire (1) à mettre en place et sa longueur correspondant essentiellement à la longueur de la capsule (1) à mettre en place, 20
- une aiguille de pression (7) agencée de façon à pouvoir être insérée dans l'ouverture (5) du moule de jonction (4) à l'extrémité opposée à l'extrémité d'entrée du mandrin (6) et agencée de façon à pouvoir en être extraite, le bout de l'aiguille de pression (7) étant ouvert et son diamètre extérieur correspondant essentiellement au diamètre intérieur de la capsule creuse (1) à mettre en place, 25
- des moyens servant à insérer le support (3) dans l'ouverture (5) du moule de jonction à partir de la même extrémité que le mandrin (6), ainsi qu'à en extraire le support, 30
- des moyens de commande servant à commander la manoeuvre mutuelle des parties (4', 4'') du moule de jonction (4), du mandrin (6), de l'aiguille de pression (7) et des dispositifs d'insertion du support (3) et 35
- des moyens de mise sous pression servant à mettre sous pression l'aiguille de pression (7). 40

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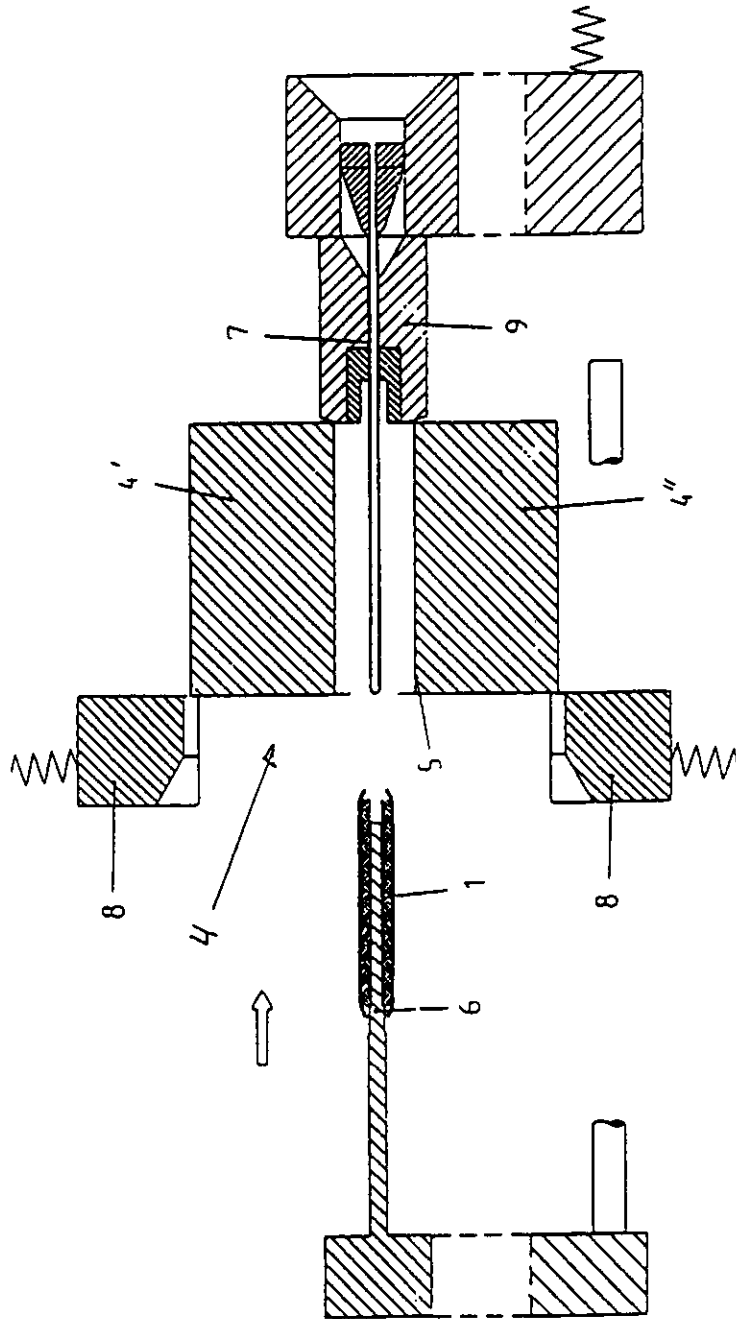


Fig. 1

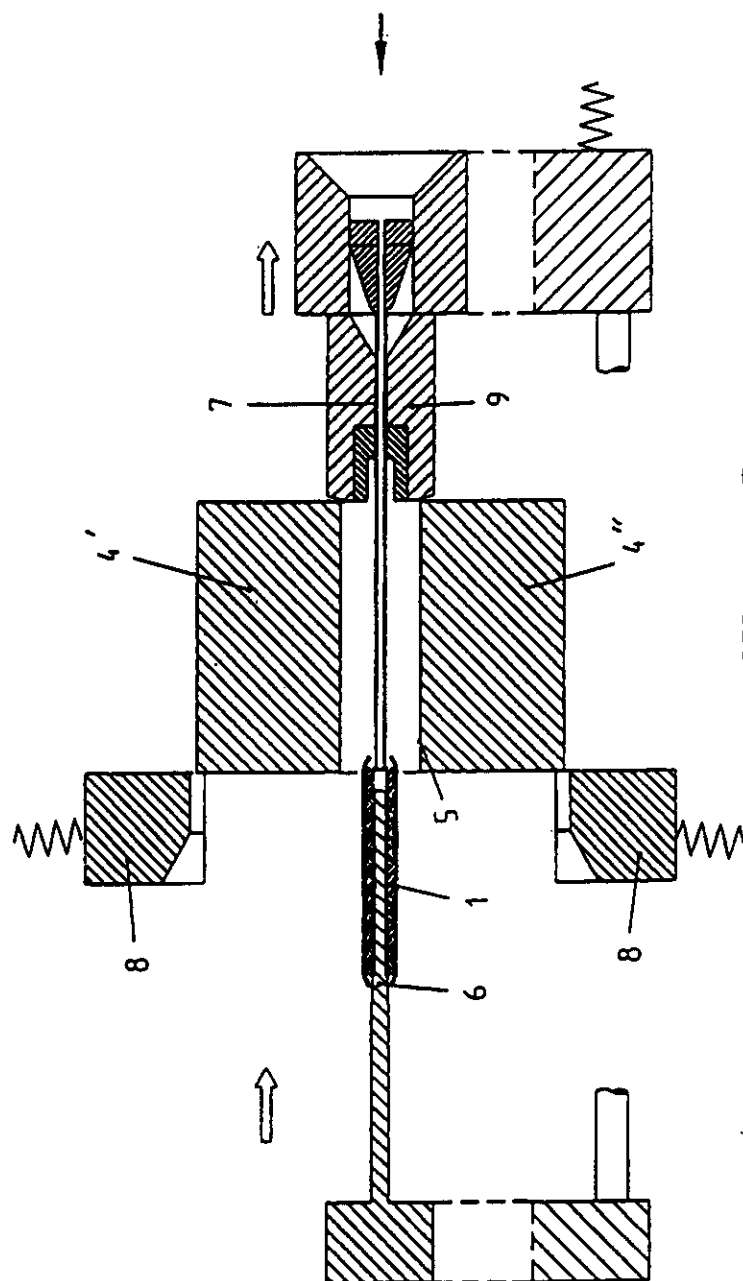


Fig. 2

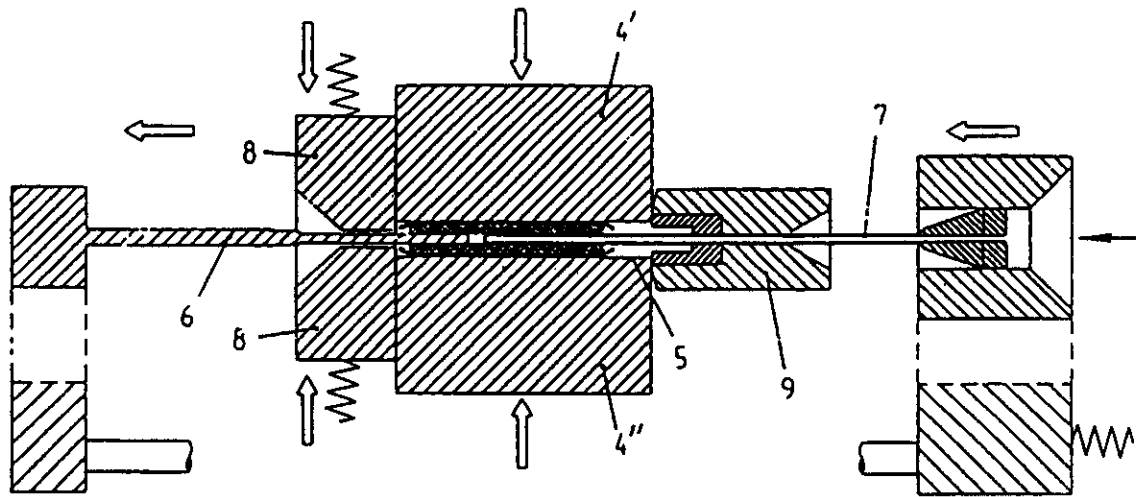


Fig. 3

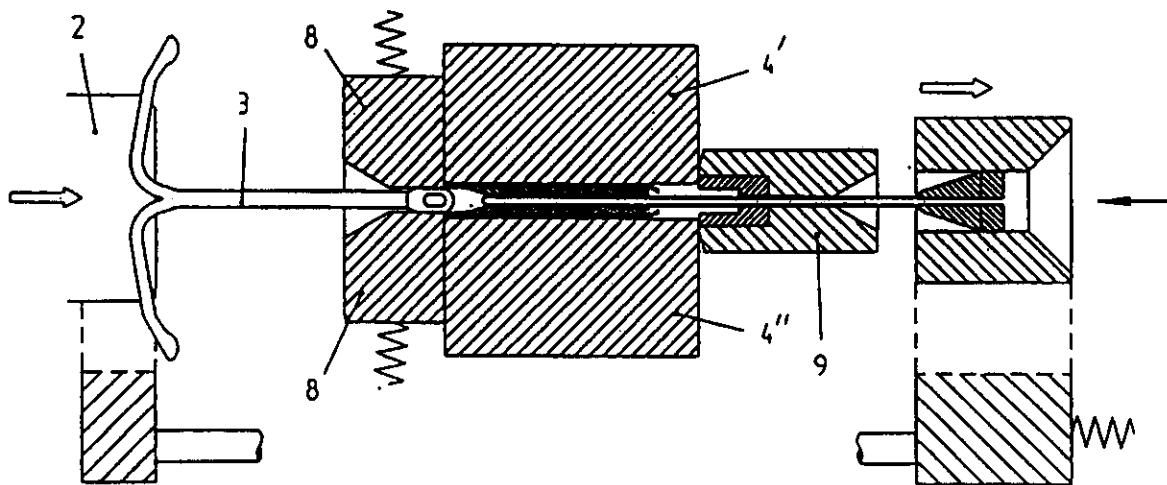


Fig. 4

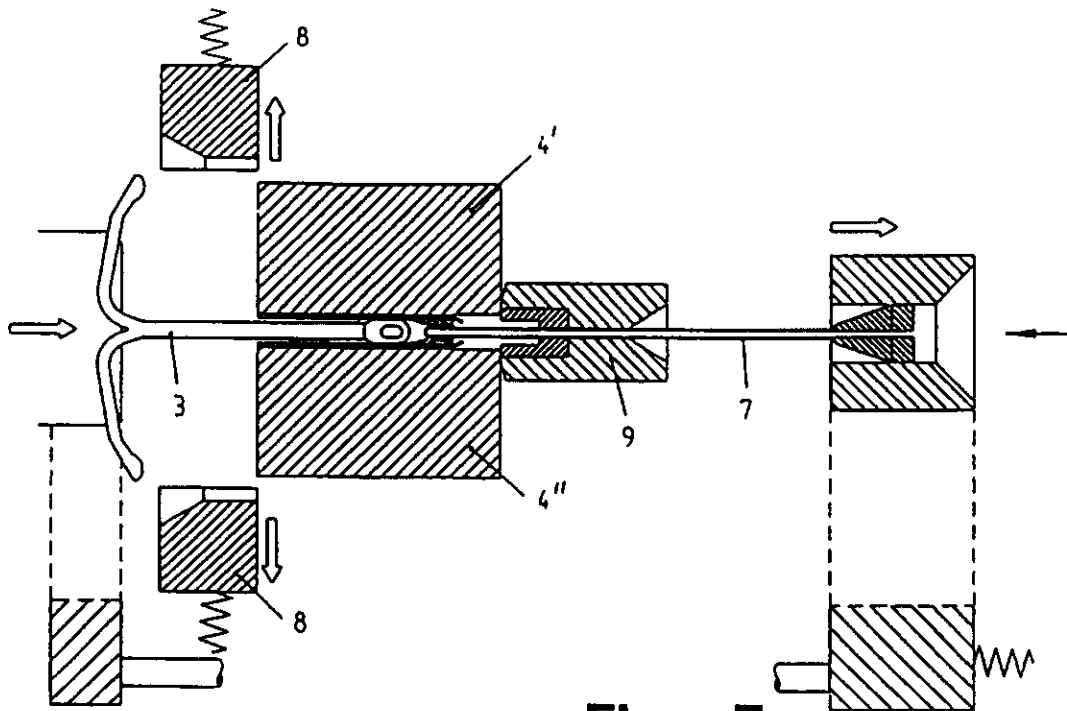


Fig. 5

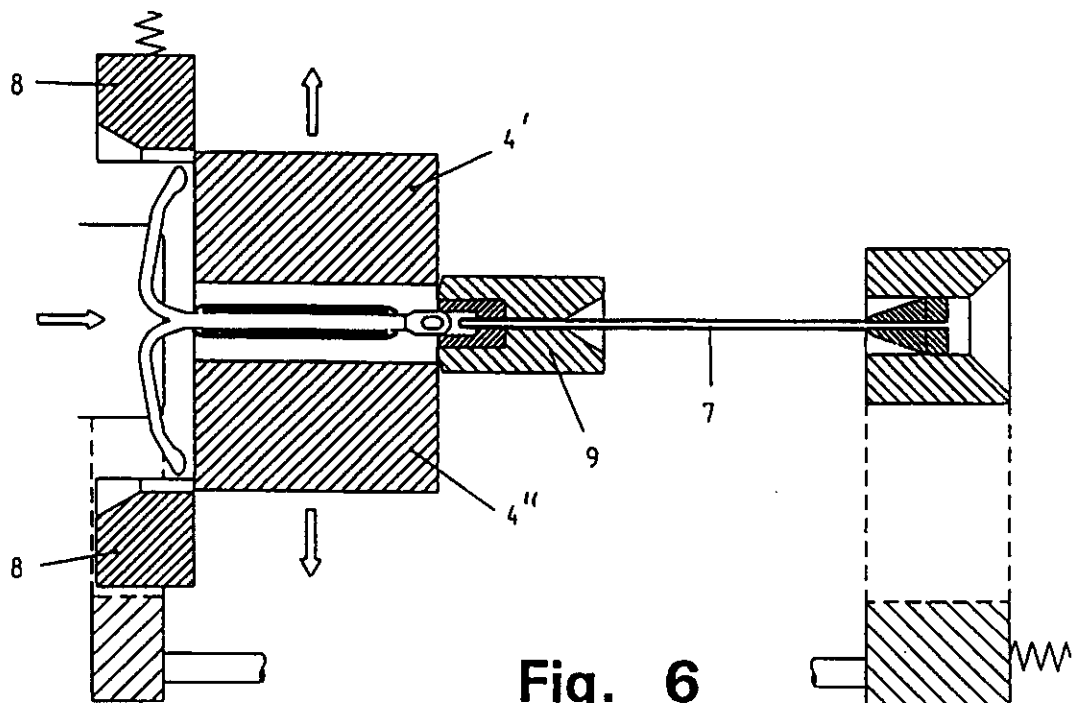
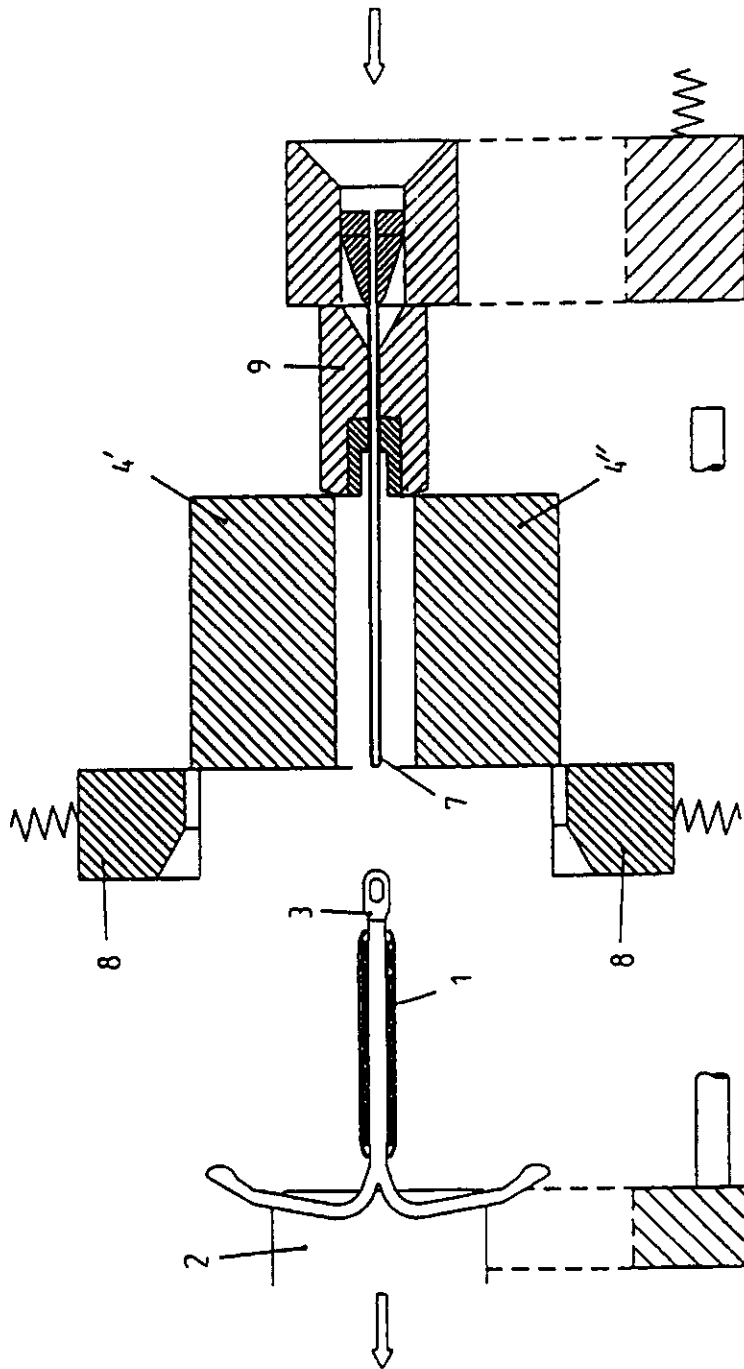


Fig. 6



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